THE ENGINEERING AND MINING JOURNAL
AND
COAL

Entered at the Post-Office of New York, N. Y., as Second-Class Matter.

VOL. XLIV. OCTOBER 29. No. 18.

RICHARD P. ROTHWELL, C.E., M.E., ROSSITER W. RAYMOND, Ph.D., M.E. } Editors.

Cable address: "Rothwell," New York.

Books for review, and all communications for the JOURNAL, should be addressed, Managing Editor, P.O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P.O. Box 1465, New York. Articles written by Mr. RAYMOND will be signed thus *; and only for articles so signed is he responsible.

The following gentlemen are authorized to receive advertisements and subscriptions for the ENGINEERING AND MINING JOURNAL:

Mr. C. A. Green, for New York.

Mr. J. Viennot, 504 Walnut street, Philadelphia, for Pennsylvania, Maryland, and Delaware.

Mr. A. H. Taylor, room 3, 166 Randolph street, Chicago.

Mr. James A. Powers, 198 Wisconson Street, Milwaukee, Wis.

Mr. W. H. Doyle, Bessemer, Mich.

Mr. O. J. Frost, care Boston & Colorado Smelting Company, 11 and 13 Clayton Block, Denver, Colo.

London Office: Finsbury Chambers, 76 Finsbury Pavement, London, E. C. Mr. Thomas B. Provis, Civil and Mining Engineer, Manager.

SUBSCRIPTION PRICE, including postage for the United States and Canada, $4 per annum; $2.25 for six months; all other countries in the Postal Union, $5 = 20s. = 25 francs = 20 marks. All payments must be made in advance.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders, or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING COMPANY.

Advertising Rates.—See page XVI.

THE SCIENTIFIC PUBLISHING CO., Publishers.
P.O. Box 1833. 27 Park Place, New York.

CONTENTS.

	PAGE.
Railroads and Forestry	307
The Value of Faith in Mine Reporting.	307
The *Herald's* Hunt of the Tortilita Kitten	307
The Chlorination of Gold Ores	308
The Unsafe Davy Safety Lamp	308
Production of Clay	309
Irregularities of Lodes, Veins and Beds	309
Annual Report of the Division of Forestry	309
The Manual of Lubrication	310
Modern American Methods of Copper Smelting	310
The American Chemical Industry	310
Iron Brick Paving Stones	311
Reynolds Patent Blowing Engines	312
Electro Plating with Aluminium	312
The Reduction of Alumina	312
Influence of Silicon on Steel	313
Saccharification of Starch	313
The French Alkali Trade	313
The New Element Germanium	313
Rio Tinto Company (Limited)	313
Manufacture of Sulphuric Acid	313
The Chemistry of Shale Spirit	313
Books Received	313
Mining and Metallurgical Patents	313
The Metallurgy of Steel	314
Personals	316
Furnace, Mill, and Factory	316
Contracting Notes	316
Labor and Wages	316

MINING NEWS	
Alabama	316
California	316
Colorado	317
Dakota	317
Idaho	317
Iowa	317
Kansas	317
Mexico	317
Michigan	317
Minnesota	318
Montana	318
Nevada	318
New Brunsw'k	318
New Mexico	318
Ohio	318
Pennsylvania	318
Utah	318
Virginia	318
MARKETS:	
Coal	318
Boston	319
Buffalo	319
Chicago	319
Pittsburg	319
FREIGHTS	319
MARKETS:	
Metals	319
Chemicals	320
Iron	320
Louisville	320
Philadelphia	320
Pittsburgh	320
FINANCIAL:	
New York	321
Coal	324
Stocks	324
FINANCIAL:	
Boston	xiii
St. Louis	xiii
Baltimore	321
Birmingham	321
Deadwood	321
Pittsburg	321
London	321
MEETINGS	324
DIVIDENDS	324
ASSESSMENTS	324
Advertisers' Index	xvii

CONGRATULATORY letters upon the excellence and value of Dr. E. D. PETERS'S work, "American Methods of Copper Smelting," continue to reach us by each mail. All our correspondents admit that it is superior to any thing else on this subject in our language, and those of our subscribers who have failed to keep a file of the JOURNAL in which it originally appeared in serial form, are strongly recommended to secure the volume. It has been completely revised, improved, and brought up to date by the author.

WE publish this week in our correspondence column a letter from Prof. WM. B. PHILLIPS, to whose able pen we are indebted for the translation of Bergrath KÖHLER'S remarkable work upon the "Irregularities of Lodes, Veins, and Beds," published in THE ENGINEERING AND MINING JOURNAL from June 25th to August 20th, 1887. The few slight corrections now suggested by the author, testify to the skill and care with which Professor PHILLIPS performed a very difficult task, and it is to be hoped that his articles were read and appreciated at their true value by all students of mining who wish to become proficient in their profession.

RAILROADS AND FORESTRY.

Mr. FERNOW, the chief of the Forestry Division of the U. S. Department of Agriculture, has compiled and issued, as Bulletin No. 1 of his Division, a report on the relation of railroads to forest supplies and forestry, together with appendices on the structure of some timber ties, their behavior, and the cause of their decay in the road-bed; on wood preservation; on metal ties; and on the use of spark arresters. Mr. Fernow's own work in this report has been principally editorial. He has, however, himself contributed an interesting paper on metal railroad ties, constituting the third appendix, and summarizing foreign experiences in this respect. The most interesting papers to mining engineers are that of Mr. P. H. DUDLEY on the structure, behavior and decay of various timber ties, and that of Mr. HENRY FLAD on the preservation of wood. These papers, although primarily referring to railroad ties, are largely applicable also to the use of timber in mines, and may be studied with advantage by mining engineers. The report as a whole reflects credit on the Forestry Division and its skillful and industrious chief. *

THE VALUE OF FAITH IN MINE REPORTING.

THE Harney Peak Tin Mining Company is again attracting attention, and the Dakota papers tell us that "about two car-loads of good and rich tin ore from the Etta were being boxed up preparatory to shipment to England for the furtherance of the Harney deal." Our information indicates that two out of the three English commissioners have been captured by Mr. WILSON, and will report that the Harney Peak tin prospects are immense, and worth $10,000,000. The Mr. TAYLOR, one of the two sanguine Englishmen, is a stock broker, and is not a mining expert of the firm of JOHN TAYLOR & SONS, which may explain how it is that he saw tin everywhere where he was told to look for it, and imagined it to be everywhere else. The third member of the commission, we have it from entirely trustworthy authority, though, perhaps, not a technical expert (*none* of the commissioners sent to report on the value of the mine were experts, which is characteristically English, you know) had a pretty good supply of that first essential of an expert—common sense—and in the language of the West he "dropped on" the thing, and, with a disgusting amount of curiosity, went poking around the mines alone at night, or with his private guide, and recklessly took his own samples, the assays of which bear no resemblance to those of the samples collected by stockbroker TAYLOR, and "wanted to know, you know," why some of the shafts in solid hard rock were carefully lined up with plank, so that the rock, said to be full of tin, could not be examined, and why the door was locked and "no admittance" allowed to the "White Tunnel," so named, it is said, because the rock in it is perfectly white and does not show a speck of tin.

This extremely ill-mannered and disagreeable commissioner showed a deplorable lack of faith in official statements, and even went around asking the most inconvenient if not impertinent questions from disinterested outsiders. Now what could be expected from such a course but that the glamour of the ten million dollars that converted into tin every thing touched by the pure and confiding faith of the other commissioners should have lost its power on this unworthy subject, and the black specks in the rock which to others were tin stone, to him appeared simply as worthless hornblende. Alas for this degenerate and unbelieving age, which so often presumptuously casts aside the gifts which a pure and sublime faith capable of swallowing mountains would bring to its happy possessors.

THE HERALD'S HUNT OF THE TORTILITA KITTEN.

THE ENGINEERING AND MINING JOURNAL is always pleased to have the co-operation of any paper, and especially of any of the great and influential dailies, in exposing and thwarting the trickery and swindling which are the bane of mining. The record of this journal has stamped it as the exponent of American mining and the devoted advocate of the honest development and administration of the mining industry, and it can point with no small degree of satisfaction to numerous disreputable schemes which its disinterested efforts have rendered abortive.

It has always been a matter of regret to us that our great dailies here, with few exceptions, rarely lend their immense influence to the protection of the public from specific mining frauds, though they occasionally denounce in general, inaccurate, and misleading terms, the whole business of mining, and thus do perhaps more harm to a great and legitimate industry, than would the successful floating of a dozen of the nefarious schemes which they cite as examples of "mining investments."

It is indeed surprising that papers, so lavish in the expenditure of their abundant means in gathering general news, or in hunting down some private scandal, are yet unwilling to investigate or aid in exposing the frauds that frequently cost investors immense sums, and that tend to discredit an industry second only to agriculture as a source of our national wealth and prosperity. The New York *Herald* appears to have found this subject worthy of its attention, and from among the herd of wild cats that have been pursued and pelted by THE ENGINEERING AND MINING JOURNAL for months, it selects one disreputable, maimed, and limping kitten, the "Tortilita," as a fit subject for a rare and startling exhibition of its enterprise in the cause of virtue.

This miserable little specimen of the genus felis has been crawling back

towards its lair since the scotching it received in THE ENGINEERING AND MINING JOURNAL of June 28th (when it first came out under the protection of the Consolidated Petroleum and Mining Exchange), July 9th and 23d, of August 27th, and of October 1st, and under the vigorous blows of the *Evening Post*. The attack of the *Herald*, therefore, though worthy of all commendation, would have rendered greater service had it been made in June last; when we so promptly placed investors on their guard, that owing to our warning less than $50,000 in all has been taken from the public on sales of this worthless stock. If the voluminous cackling and self-congratulation in which the great daily indulges over its tardy shot at the miserable limping little "varmint" appears somewhat childish and ridiculous, we are disposed to excuse it as a perhaps natural exultation over a valorous achievement in a new and unfamiliar field.

We hope the slight resistance it met with in this case will give it sufficient courage to attack some of the larger game, of which there is an abundance in sight, and if its zeal for virtue still holds out, we will gladly put it upon the track of many other schemes in which its enterprise may be shown with constantly increasing advantage to the public.

THE CHLORINATION OF GOLD ORES—THE NEWBERY-VANTIN PROCESS.

The treatment of gold-bearing ores by the process introduced by PLATTNER, and subsequently improved upon by different experimenters at intervals during the last forty years, is admitted to be far from perfect, though its practical success in treating suitable ores, such as those of Grass Valley, Nev., where the custom mills guarantee a return of 95 per cent of the contained gold, makes it still the most generally used method we have.

The objections to the Plattner method are that it requires much time, labor, and a large plant; its results, even in the most favorable cases, are not as good as have been attained by the barrel chlorination; and though no known method of chlorination is adapted to any but extremely fine gold, the Plattner is still more exacting in this respect than are some others. Metallurgists are always ready to welcome any improvement on this useful, though imperfect, method. Yet this should not lead them to accept without investigation every claim to originality or improvement that is made by sanguine or designing inventors.

It is not long since our London exchanges wrote of the Cassel chlorination process as something wholly original and as extremely valuable; conclusions which THE ENGINEERING AND MINING JOURNAL promptly dissipated by showing that the process had been tested some years previously here in New York, when Mr. CASSEL was employed in the New York Metallurgical Works, and that not only was the process a failure, but Mr. CASSEL did not own it.

We are now greatly surprised to find our able contemporaries, London *Engineering*, and *The Engineer*, bringing out editorially as "a new method of chlorination" one which has for years been familiar to American engineers.

This so-called new process, said by our contemporaries to have been discovered after years of patient research by Messrs. COSMO NEWBERY and CLAUDE VAUTIN, we briefly summarize as follows:

The auriferous mineral is—if it be a sulphuret—first roasted as completely as possible, and then deposited in a hopper placed over the chlorinator, which is a revolving barrel constructed of lead-lined iron, and of sufficient strength to stand a pressure of 100 pounds to the square inch.

A charge of about 30 cwt. of ore is run from the hopper into the chlorinator, and water and chlorine producing chemicals (chiefly sulphuric acid and lime) are added. The man-hole cover is placed in position, and the vessel is then gas-tight. A valve of special construction, attached to the barrel on the side opposite to the man-hole, is then connected by an india-rubber hose to an air-compressor, and air, under a sufficient pressure to liquify chlorine gas (about 90 pounds per square inch) is forced into the chlorinator. The valve is then closed, the hose disconnected, and the vessel, with its contents, caused to revolve by frictional gearing, about 10 revolutions per minute, for from one to four hours, according to the size of the gold grains, during which time the chlorine has combined with the gold to form the soluble chloride. The chlorinator is then stopped, the air pressure withdrawn, and any chlorine that exists in the form of gas after the air-pressure has been removed is passed into lime water and absorbed, thus preventing any danger to the workmen. The cover to the man-hole of the chlorinator is then removed, and the vessel again put in motion, when the contents are discharged into the filter below, which consists of a large lead-lined iron vat with a false bottom, and connected with a vacuum pump by a pipe underneath. As soon as the contents of the chlorinator are deposited in the filter the communication between the latter and the vacuum pump is opened, and the solution of gold chloride rapidly withdrawn from the ore and deposited in a holder. Water is continually added to the surface of the ore in the filter and the solution running through, tested from time to time, and, when found to be quite free from gold, the connection with the vacuum pump is broken, the filter tipped up, and the residue or tailings fall into a truck and are run out and dumped upon a heap.

The whole process has lasted about an hour; the solution is now passed through charcoal in another vessel, which causes the chloride of gold to be decomposed, the pure metal being deposited on and in the charcoal and obtained from it by burning and fluxing the ashes with borax.

In THE ENGINEERING AND MINING JOURNAL of August 7th, 1880 (seven years ago), will be found a description of this process, which was then claimed by Dr. MEARS, of Philadelphia, and was at that date in practical use in the Phoenix mine, North Carolina.

The invention of precipitation by filtering the chloride solution through charcoal was claimed by a Mr. DAVIS, who was working with Doctor MEARS, and was mentioned in THE ENGINEERING AND MINING JOURNAL May 22d, 1880, page 355. Messrs. NEWBERY and VAUTIN, therefore, required but little ingenuity to make this important discovery, both these processes having been patented in this country.

Some years ago the company owning the Mears patents endeavored to dispose of them in England to an organization which proposed using them in the Australian colonies, but on investigating the claims they were found invalid, and since then the process has become public property.

We presume no claim to be made to the invention of the vacuum filter, and this being so, the pretensions of Messrs. NEWBERY and VAUTIN are thus fully disposed of.

We ourselves used this process in 1882-3-4 and 1885, and we have before us in our note books the detailed records and separate assays of about 1500 charges that were chlorinated by it.

A few extracts from these regular mill runs show what excellent results were obtained in treating roasted arsenical pyrites concentrates.

1884.	Value of roasted ore in gold.	Sulphuric acid used.	Chloride of lime used.	Pressure in pounds. Commenc m't	Pressure in pounds. End.	Time in hours	Value of tailings in gold for each ton of ore.
January 24	$69.76	40 pounds	35 pounds	20	16	4·50	$0·52
" 25	69.76	40 "	35 "	24	18	1·50	2·56
" 26	69.76	40 "	35 "	21	16	5·00	traces
" 30	66.14	40 "	35 "	29	20	2·50	traces
" 31	66.14	40 "	35 "	12	14	3·00	0·77
February 4	64.59	35 "	30 "	11	15	3 00	0·52
" 10	64.59	35 "	30 "	12	10	3 00	1·56
" 13	55.80	35 "	30 "	13	15	3 00	1·55
" 14	55.80	35 "	30 "	16	16	2·30	1·55
" 16	54.77	35 "	30 "	22	16	3·05	1·04
November 28	76 47	35 "	30 "				2·58
" 29	91.98	35 "	30 "			1 30	2·32
December 2	72.34	35 "	30 "	From 10 to 15	3 to 0	to	2·58
" 4	93.01	35 "	30 "			2	3·62
" 5	75.44	35 "	30 "				3·10
" 6	77.51	35 "	30 "				3·62

Experience showed that no better results were obtained with a pressure of 60 pounds to the inch than with 10 pounds, while the quantities of acid and bleach could thus be reduced to about one half. The essential condition appears to be, to keep a saturated solution, and as long as there is any pressure of chlorine at the end of the operation, this is secured. The efficiency of the process is due almost exclusively to the attrition of the particles in the revolving cylinder, which thus keeps the gold bright and therefore in favorable condition for the action of the chlorine.

Those who have had any practical experience in working with chlorine, under a pressure of 100 pounds to the square inch, will certainly feel grate ful for this information.

We do not understand Messrs. NEWBERY and VAUTIN'S method of mixing the acid and chloride of lime; it is evident they must be kept apart until the chlorinator is closed, and as the air pressure of 100 lbs. is said to be put on before revolution, there is no knowing what the pressure would be when the chlorine was generated.

The last six lots given in the above table were consecutive lots, and represented 5 tons each, the tailings being the averages of five separate assays of one ton each; the chlorinator then in use holding a charge of one ton. Subsequently a three-ton chlorinator was used. The average time of treating a one-ton charge was from an hour and a half to two hours. The washing of the charge on the filter, when done in the manner indicated, is by no means perfect. Simple devices were adopted, by which it was made both speedy and efficient.

The precipitation of the gold from the chloride solution by means of ferrous sulphate offered, in the treatment of arsenical ores, insurmountable difficulties and had to be abandoned, for it precipitated a vast quantity of other things than gold. The precipitation by charcoal, simple and efficient as it is, presented the same difficulties, and the burning of the charcoal, whose every pore was filled with incombustible material, and the treatment of the voluminous ash, which was simply a new kind of ore, presented difficulties that will not willingly be encountered a second time.

The precipitation of the gold was effected most economically and satisfactorily by the use of gaseous hydrogen sulphide, made from paraffin and sulphur. But the space at our command will not permit us to enter into the many important and interesting experiences attending the economical production of hydrogen sulphide, its use and the collection of the gold precipitate; it is sufficient to say that these were extremely important, and that they resulted in a satisfactory solution of the problem that was not, in this case, attainable with the charcoal precipitation.

The Unsafe Davy Safety Lamp.—According to Mr. A. H. Stokes, one of Her Britannic Majesty's Government inspectors of mines, the Davy lamp is no longer to be considered in the light of a safety apparatus, and from that point of view is henceforth to be regarded as useless. The Royal Commission appointed to report upon the "Mines Regulation Act," declared that the lamp is "unsafe in a current with a velocity of six feet per second," and, as Mr. Stokes says, that the combined rate of the miner's walk and the necessary ventilation will constitute at least that amount of speed in the air, it must necessarily be banished from the mines. He adds that in his own experience many explosions and deaths have resulted from its use.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

Production of Clay.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Has clay ever been artificially produced, or has it been demonstrated that, after being burned at a full white heat, it can be made to recombine chemically with water, and thereby regain its plasticity? This question is, of course, of merely scientific interest. Respectfully,

NEW YORK, Oct. 26, 1887. R. S.

Irregularities of Lodes, Veins and Beds.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I am now in a position to correct a few mistakes in the translation of the above work, Bergrath Köhler having sent me his own corrections, together with a copy of the second edition of his book. They are as follows:

Vol. XLIV., No. 4, p. 60, in the description of Fig. 29, for "construct at r the dip angle w of the vein (= 55°), as well as the dip angle z of the faulter (= 65°)," read "construct at r the *complement* of the dip angle w of the vein (= 55°), as well as the *complement* of the dip angle of the faulter (= 65°)."

Referring to Figs. 30 and 32, $G\ B$ should be drawn exactly parallel to the line of intersection.

In the same volume, No. 5, p. 79, for

Log sin 20° = ...	9·5340517 — 1	Read Log sin 20° = ...	9·5340517 — 10
Log sin 40° = ...	9·8080675	Log sin 40° = ...	9·8080675 — 10
	0·7259842 — 1		0·7259842 — 1
Log tang 50° = ...	10·0761865	Log tang 50° =.....	10·0761865 — 10
	9·8021707		9·8021707 — 10

In the second edition of the book above referred to, published in Leipzig, 1887, pp. 34-39, are to be found other interesting and instructive examples of shoved faults (No. 8 p. 130), to which I would respectfully call the attention of the student. Respectfully,

DEPARTMENT OF CHEMISTRY, MINERALOGY AND MINING, UNIVERSITY OF NORTH CAROLINA, Oct. 25, 1887. W. B. PHILLIPS, Ph.D.

NEW PUBLICATIONS.

U. S. DEPARTMENT OF AGRICULTURE: ANNUAL REPORT OF THE DIVISION OF FORESTY FOR 1886. By B. E. FERNOW, Chief of Division, Washington, 1887.

SECOND NOTICE.

Adding one third to the estimate of the census of 1880, to avoid any danger of an underestimate of the supplies of white pine, spruce and southern pine in the United States, Mr. Fernow finds that in round numbers 600,000,000,000 feet board measure might be considered as standing in that year, to supply an annual demand of not less than 12,000,000,000 feet. It is manifestly the demand and supply for the whole eastern country that must be considered, and not the condition in any one State; for nothing is more certain than that the States in want of timber will draw upon the resources of those which still have it in abundance.

It has been said that the second growth of white pine coming forward in New England may be relied upon for supply; but this wood is mostly cut when only fit for box-boards, and will play no important part in the supply of building materials. Mr. Fernow points out, moreover, that the requisite quality for building purposes which the Scotch pine attains in seventy years is hardly reached in ninety by the white pine, while, according to good authority, the long-leaved pine requires two hundred years of growth to furnish large timber of good quality. It is evident that, of these woods, nature's slow supply will prove a most inadequate compensation for the rapid ravages of man. The hard-wood forests, on the other hand, have greater reproductive power, and are in less danger of extinction or deterioration. Yet even these are steadily diminishing.

As we said in our former article on this subject, Mr. Fernow looks to the farming community, holding nearly 38 per cent of the forest area of the country, as the most likely, if properly instructed, to inaugurate a wise conservative policy in the management of woodland. With regard to other private forests, it seems almost wise to hope that the present reckless waste may go on, until the pressure of relative scarcity coerces a reform.

The rise in the prices of lumber, which may be confidently expected at no distant day, will make large forestry operations remunerative; and, in view of the time required for such undertakings, it is probable that, if begun at present, they will not mature too early to realize this advantage. Upon the basis of *present* prices for lumber, forestry for the production of building timber would not be profitable, except under special conditions. Mr. Fernow declares that forestry proper: that is, the continuous production of wood for lumber, consuming only the actual yearly increment of the forest, involves the following conditions: The stocking of large contiguous areas of forest growth; a considerable capital represented by such lands, tied up for a long period before paying accumulated interest; a careful and unremitting management; and a serious risk, in sparsely settled regions, of destruction by fire. The last item might be covered by insurance; but until our forests are more adequately protected, no insurance can be obtained at rates which the industry could bear. And no device will remove from the business the peculiar character, well described by Mr. Fernow, when he says: "It is one in which the inaugurators have less interest than their successors, and which, therefore, according to human nature, will be neglected longer than any other, unless governments or other continuous corporations engage in it or foster it."

We fully agree with him that the government should encourage this industry in every legitimate and practical way, and that large land-holding corporations, such as States and railway and mining companies, should be urged to recognize its importance. But we think also that the work in which Mr. Fernow and other public-spirited citizens are engaged will tend to bring about another remedy for the last-named evil. Namely, we think it will come to pass under the operation of the laws of supply and demand, that land upon which a forest has been planted and intelligently cultivated will command an increased value by reason of its *prospective* production long before it is *actually* productive. When this shall have come to pass, the fact that many years are required to bring to maturity a forest enterprise will no longer be prohibitory.

There is therefore good reason for the course which Mr. Fernow has pursued; in introducing into his report a clear and suggestive statement of the principles of forestry, together with practical hints as to their application under American conditions. This part of the report is, in fact, an invaluable manual for beginners; and we think it can not fail to do much good.

Mr. Fernow lays down, as the general principles of forestry, the careful and constant preservation of the humidity of the soil and the prevention of the undue exhaustion by surface evaporation; such a choice and arrangement of species planted as will promote the desired development; methods of management involving the minimum of labor; and finally (when continuity at least expense is desired) the choice of methods securing the natural reproduction of the forest.

The protection of the soil against sun and wind is best secured by close planting. Mr. Fernow well says, "The war against underbrush and the notion of a 'clean grove,' in which the trimming of 'superfluous' branches and twigs occupies the loving care of the amateur planter, are two monstrosities, against which a serious protest should be made for the sake of successful forestry." On the other hand, weeds are not desirable undergrowth; and the first object of the planter should be to cover the ground as quickly as possible with a dense wood-growth, the shelter of which will increase and prolong the humidity of the soil.

Since most trees have a more or less dense foliage in youth, but different species grow thinner at very different rates as they grow older; since, moreover, the tendency to thin out is modified by local conditions of soil and climate; and since, finally, the forest-planter must keep his grounds shaded through the whole period of growing, he must choose his species in accordance with their classification in these respects. While certain trees may be planted in forests by themselves, the general rule should be mixed planting. The advantage of such mixtures of species has been often supposed to lie in the variety or the material which they furnish, the difference in the requirements which they make upon the soil, and the difference in the character of their root-systems; but the consideration already mentioned, namely, the greater ease with which the soil can be kept covered and its humidity preserved, and also the more complete protection from various injuries which mixed growths afford, are the most cogent reasons for their adoption.

The mixture may be started simultaneously, or species may be added by planting or removed by cutting from time to time.

Mr. Fernow's intelligent explanation of these conditions is practically useful in view of the fact that much crude talk has been current (from people who were still stumbling through the alphabet of the science, but thought they knew it all), on the advantages of mixed planting. The notion seems to have been "the more mixing the better," as though there were a mysterious benefit in mere variety. In connection with this, there has been also in some quarters an apparent feeling that the introduction of exotic trees would be the highest kind of scientific forestry, whereas our own forest flora, with a very few desirable foreign trees, furnishes an infinite variety of choice; and good forestry, in any given locality, will avoid the introduction of too large a number of species, confining itself to the selection of suitable kinds for the locality, in number only sufficient to secure the desired conditions of growth.

Mr. Fernow gives a valuable table of the most important timber trees of the United States, with remarks as to their distribution, qualities, and requirements of growth. In view of the immense area and various climatic and other local conditions of the United States, it is evident that much observation and experiment will be required before complete data for tree-planting will be available for all parts of the country. The statistical work, such as has been heretofore done, is not what is wanted; and the chief of the Forestry Division has been wise in limiting its activity in that direction. Incomplete statistics do more harm than good, except so far as they arouse attention to the subject, and impress upon legislators and citizens the necessity of action. What is needed is detailed phenological and biological study and experiment. In this direction, Mr. Fernow's division, operating through private naturalists and institutions of learning, has already stimulated much useful activity, and will be able to accomplish a great deal with its small means.

That these means should be increased, both by more liberal appropriations for the Forestry Division as now constituted, and also by more efficient legislation, and, if practicable, by the organization of a real Forest Department, we heartily believe; and we hope that the ability displayed on the limited scale of the present operations of the division will lead to a wise increase in its sphere of action.

Mr. Fernow quotes from a recent letter of his own a plan for a Forest Department, including a central bureau, traveling and local inspectors and forest guards. This bureau would have charge of the public timber domain, regulating all cutting of timber upon it for local uses, and with a view to natural re-forestation. The cost of it would depend on the number of districts to be formed in the country. Mr. Fernow, taking Colorado as an example, with 5,000,000 acres of public domain, requiring 300 rangers and 10 inspectors, places the round figures at $300,000. This, he says, is but one third of the public property destroyed by fires in that State yearly. Moreover, he thinks that 50,000,000 cubic feet of timber should be sold from the public lands in Colorado annually without ruining the forests. In addition to the mere preservation of the forests (mostly in the mountains), Mr. Fernow suggests that governmental plantations, serving also as schools of forestry, should be placed on military reservations.

We have found it difficult to select from this report, every page of which is full of interest, the materials for our two articles, which, long as they are, are too short for a just review. But we hope that those of

our readers who take an interest in the subject will get the document for themselves. It certainly confers upon the Agricultural Report, of which it forms a part, a higher value than the productions of that department have been accustomed to possess.

The Manual of Lubrication. By Louis Simpson. New York. The Oil, Paint and Drug Publishing Co. Price $2, pp. 100.

This little volume will probably, as the author himself says, "supply a long felt want," and, therefore, deserves to be read by all mechanical engineers or users of steam power, to whom the question of a good or a bad lubricant for their machinery is a matter of the very first importance. To say that the book contains nothing very original "would merely be to state what every one who is at all acquainted with the subject will immediately recognize; it nevertheless contains a great deal of practical information that may be turned to account by all sensible and thoughtful men. Mr. Simpson has endeavored to show what have been in his own experience" the best means for obtaining pure and reliable oils in the open market, and for detecting those fraudulent mixtures which, he avers, are so commonly supplied to unsuspecting buyers by unscrupulous dealers; and he has done this so well in his own peculiar way that it would be unfair to criticise him from a chemist's standpoint. If he had known his own strength, however, he would have written a few more such excellent chapters as VI., VII., VIII., IX., and XI., and neglected a portion of the rest; for his rough and ready tests have little value, and, generally speaking, are far more likely to confuse than assist his readers. What large user of lubricating oils, who is not himself an expert chemist or has not a chemist in his employ, is likely to grasp all the details connected with the determination of specific gravity, flashing point, saponification, viscosity, or acidity? As to our efficient analytical chemists, it can teach them nothing, for there are few branches of organic chemistry which have received more attention during the past ten years than that relating to the separation of fatty from mineral hydro-carbon oils, and the determination of all varieties of the former by Kœttstorfer's "saponification equivalent" and other processes. In Mr. Simpson's condemnation of grease for lubricating machinery we cordially concur, as, broadly speaking, we do in his advocacy of the more general use of mineral oils in place of those of animal origin, because they are cheaper, cleaner, and in every sense more efficient.

MODERN AMERICAN METHODS OF COPPER SMELTING.

In a letter just received from Dr. Theo. B. Comstock, professor of mining engineering at the University of Illinois, he says: "I duly received the copy of Doctor Peters's work, and although I knew of the great worth of the material contributed by him to your Journal, I am agreeably surprised at the even better appearance of the complete book. I do not think we have anything in metallurgical literature treating of American methods of reducing other metals which can be placed beside this book. It is the most full and concise, as well as the most practical, treatise of its kind I have ever read. It exactly meets the need of the student and the acting metallurgist. How much we want others of its class upon kindred subjects!"

Prof. Byron W. Cheever, of Michigan University, says: "I consider the work of great value to all metallurgical students, and shall certainly advise all those under my care to purchase it."

Mr. W. L. Hoyt, of the St. Louis Smelting and Refining Company, says: "Its practical character renders it a most valuable aid to all interested in that line."

The *Engineering News*, of New York, of October 22d, says: "This very handsome and well printed treatise we take to be beyond question the most complete treatise on copper smelting in existence. It is full of detailed statements of cost, and bears on every page the stamp of a thoroughly practical work."

Mr. Charles Kirchhoff, Jr., editor, says in the *Iron Age*, of New York, of October 27th: "Dr. Peters, who has had a very extensive experience as an engineer and manager of copper works in different parts of the United States, has departed from the policy which unfortunately too many active men adhere to, that of hoarding their experience. During the past decade the development of the copper industry of the United States has been exceptionally rapid. It has been accompanied by the necessity of grappling with new conditions, and it has led to what may be termed purely American modern practice. There has been little that is revolutionary in this change. Progress has not followed lines which appeal to the lover of the sensational. It has been in the direction rather of steady improvement of detail. It is natural that under such circumstances the knowledge of what has been accomplished is confined to a few, making the danger that it may escape attention all the greater. A few valuable contributions to recent literature from the pen of such authorities as Mr. James Douglas, Jr., and Mr. Peters himself have, it is true, recorded some of the successes of American metallurgists, but it has remained for the latter gentleman to gather the material in a harmonious whole. Dr. Peters cuts adrift all of the material which only too frequently incumbers text-books. Instead of presenting in a slightly modified form the substance of such works like Kerl and Percy, he has evidently started with the idea that these standard works are known to his readers, and that his mission is to teach the beginner what these professors have failed to state, not being men who have grappled with the perplexities of active practical work. It is this, we think, which makes Dr. Peters's work unique and gives it exceptional value. He practically surrenders to the reader a greater part of his note-books, with the records of long years of experience, and publishes freely the results of his work, warning against the snares and pitfalls which have endangered his path, and points to the means he found to avoid them. We find throughout the book numerous estimates of cost under normal conditions, which alone will be prized by the beginner, and be frequently referred to by the copper smelter, even after many years of accumulated experience. We can not too highly commend the work, and can only deeply express our regret that we have nothing similar to it, or approaching it, in the wide realm of the metallurgy of iron and steel or of mining."

THE DEVELOPMENT OF THE AMERICAN CHEMICAL INDUSTRY.*

By Dr. Francis Wyatt.

(*Continued from Page* 291.)

COST OF CONCENTRATION.

Coming now to the important question of cost by these two methods, we shall be understood when we say that it has been extremely difficult to establish comparisons that may be regarded as reliable, for the simple reason that the majority of our manufacturers still lay claim to the possession of trade secrets (?) which, were they to be disclosed, might vastly increase the competition and augment the profits of their neighbors. (?) Upon the wisdom or propriety of this view we have no inclination to express ourselves; the fact remains that all attempts to obtain any thing more than approximations have, with one or two notable exceptions, proved abortive, our inquiries having been answered either by misleading generalities and gross exaggerations, or by point blank refusals to enter into details. We have consequently been compelled to largely supplement the facts furnished by our own experience, by data gathered through the courtesy of friends abroad, and while this has been a very arduous task, entailing a vast amount of correspondence and explanation, we flatter ourselves that in presenting the following results we are not very wide of the mark:

Table of comparison showing the actual cost of concentrating 1 ton of Sulphuric Acid to 66° B. in glass retorts and platinum stills.

A. Glass Retorts.		B. Platinum Still.	
Concentration of 60° B. acid from Glovers tower.		*Concentration of 50° B. acid from the chambers.*	
1 ton of coal, at $4 per ton	$4.00	18 cwt. of coal at $4 per ton	$3.60
Wages and superintendence	10.00	Wages and superintendence	7.50
Breakage of retorts	2.00	Wear and tear of the apparatus calculated as interest on this addition to the working plant (actually costing 10,000 dollars, and estimated to last four years) at 25 per cent. per annum, on an output of 5 tons per day	6.85
Wear and tear of other material and interest on this addition to the working plant (estimated to cost one thousand dollars) at 50 per cent per annum, calculated to 8 tons per day	1.40		
Total cost for concentrating 8 tons.	$17.40	Total cost for concentrating 5 tons.	$17.95
Cost per ton	$2.18	Cost per ton	$3.60

The contemplation of these facts is ample confirmation of our previous accuracy, in stating that this stage of the operations is at once the most troublesome and expensive in the whole routine of acid production; for, as we have seen, the cost of 62° Beaumé acid running from the Glover tower does not exceed $6 per ton, while to bring it from that point to the monohydrate standard, entails an actual outlay of nearly 50 per cent upon that price.

The question as to the direction in which we are to look for a remedy to this state of affairs has therefore remained to be solved; is, in fact, no less burning and important at this moment than it was twenty years ago, and continues to excite an equal amount of interest whenever it chances to be brought upon the *tapis*.

The oft-described methods proposed in turns by Clough, of this country, and Gossage, of England—the latter consisting in distributing the acid over pebbles contained in a lead tower, and causing it to be met in its descent by a current of hot air, produced by the combustion of coke,—both proved abortive, owing in each case to the enormous evaporation of acid in a vesicular state; and it may be fairly said that the only suggestions that have borne the test of reflective examination and experience are those which have designated CAST IRON as a worthy substitute for either platinum or glass. Nor need we enter into any argument to show that if this substitution were really as practicable on the large scale as it has proved to be in the laboratory, the cost of concentration would at once fall from its present heights to the position of an almost insignificant factor.

"There is nothing new under the sun," said the wisest of men, and accordingly we hasten to add that in speaking of iron we lay no claim to originality or inspiration, since more than ten years ago a chemist named Roder tried to use iron boilers, of which the interior was protected by a certain kind of enamel of his invention. There was, however, something wrong in his calculations, for he soon found, to his cost, that the enamel was unable to resist either the high temperature required, or the vastly different degrees of expansion between itself and the metal, and his innovation was abandoned as impracticable. In another case it was proposed by Seckendorff to make use of flat bottomed iron retorts, completely surrounded by fire and filled with sulphate of lead, or of lime, or with sand. The chamber acid was to be run into these until it formed a paste, and being then heated, the watery vapor first appearing was to be conducted to the chambers, while the concentrated vitriol, which came next, was to be collected in glass or stoneware vessels. Whether or not this ingenious method was ever actually tried in an acid works, or whether it never went beyond the stage of laboratory experiment, it is impossible after so many years to discover, but it is recorded by the author that the product obtained by him was perfectly pure—thoroughly concentrated and quite free from iron!

The question now comes, can not we, or why do we not, make use of cast-iron boilers or stills for the whole of the higher concentrating process, and thus demolish at one blow both platinum and glass? We know well enough that although moderately dilute sulphuric acid acts with violence and celerity upon iron, the metal is not materially, if at all affected when the water has been driven off, and we have taken advantage of this very fact to replace the time-honored glass carboys by cast-iron drums, when the oil of vitriol is intended for shipment to distant places. There is nothing impossible in the idea; and we may even go so far as to say that we have heard of such an apparatus now being satisfactorily operated within a very short distance of New York, with liquid fuel in place of ordinary coals, producing ten tons of the monohydrate in each 24 hours, and erected at a total cost of material and construction of about $2000.

We must, however, defer any thing like circumstantial, personal, or

Copyright by the Scientific Publishing Company, 1887.

authoritative statements upon this subject, until a somewhat later stage of our work, and shall content ourselves with saying that if this new application of American mechanical genius really performs all that is claimed for it by very old and experienced members of the trade, we shall have the glory of introducing to the world an invention which will, in its sphere, produce as much sensation and be productive of as much relief and profit as the Glover tower.

UTILIZATION OF PYRITES RESIDUE.

In the manufacture of sulphuric acid from pyrites, the utilization of the desulphurized cinder has at length come to be universally recognized as a factor in the economy of the process, whereby its cost may be materially reduced.

Burnt ores devoid of copper have hitherto been largely used for road making, or what is commonly called "filling," and when works are situated in marshy or inaccessible districts there can be little doubt about the excellence of the results from this practice.

There is, however, a quickly attained limit to the quantity that may be thus profitably employed, and it is therefore necessary to seek other sources for the disposal of what, by its accumulation, soon becomes a very serious and unsightly encumbrance.

From the official statistics it would appear that the quantity of iron ores yearly extracted from our own mines is, although enormous in its proportions, altogether so inadequate to the demands of our iron and steel production that we are compelled to annually import something like 1,000,000 tons from foreign countries.

In face of these figures, it is logical to assume that the cinder of iron pyrites, from which the sulphur has been burnt down to within less than one per cent, and which contain no phosphorus, and only a trace of copper, might be advantageously substituted for the imported material, in the manufacture of Bessemer pigs.

Nor does the attitude of the principal iron masters imply that they would refuse their willing co-operation in this direction, consistently with their personal interests or the necessities of their particular furnaces.

The reduction of the sulphur to the prescribed limit has hitherto been an insurmountable obstacle in the way of the acid makers, but the combustion of the ore as "fines," and the adoption of improved and inexpensive shelf burners, or, as we are credibly informed, of Spence's mechanical furnace, appears to have practically overcome this difficulty, while increasing the yield of acid. Several important contracts are said to have been recently made with smelters by New York manufacturers who use these furnaces, for a regular supply of all their "fines" cinders at from $3 to $4 per ton.

The treatment of cupriferous burnt ores, both by smelting and by the "wet" process, has been the subject of many exhaustive treatises in every tongue, and has now assumed immense industrial proportions all over the world.

Nor is it possible to discuss the relative value of the two methods with a view to absolute preference of one or the other, since the choice of either must be governed by such strictly local conditions as the cost of fuel, the cost of dissolving and precipitating agents, and last, but by no means least, the character and mineral composition of the ore itself.

It will suffice to state broadly that in districts where fuel is cheap smelting will be most profitable for cupriferous cinders with a high percentage of silica and but little silver: whereas, if fuel is dear, or if the cinders be comparatively rich in silver and gold, and poor in siliceous matters, the "wet" mode of treatment will yield the best results. The principal ores of this country belong to the first category, those of Spain and Portugal to the second.

An evidence of what can be accomplished by a combination of chemical knowledge and engineering skill, in the utilization of desulphurized copper pyrites, may now be seen at the Laurel Hill Chemical Works at Long Island, New York.

Canadian ores from the Crown or Albert mines of Capleton are used for the manufacture of acid. The self-fluxing cinders, containing about 3½ per cent of copper and 13 or 14 per cent of silica, are smelted in a Herreschoff water-jacket furnace, with sufficient raw "fines" to bring up the sulphur to 7 per cent, gas coke being used for fuel.

The average resulting matte runs as high as 50 to 60 per cent of copper, and not more than about a half of one per cent is lost in the slag.

The average daily charge for each furnace is as follows:

	48 inch furnace.	60 inch round furnace.	Rectangular furnace.
Roasted ore	51·7 tons.	76·0 tons.	76·8 tons.
Raw fines	4·3 "	8·0 "	13·2 "
Sand	2·8 "	12·0 "	5·3 "
Iron slag	....	9·5 "	.. ..
Total stock	58·8 tons.	105·5 tons.	95·3 tons.
Coke	11·5 tons or 20 per cent.	17·0 tons or 16 per cent.	17·4 tons or 18 per cent.

Only ten men are daily employed, the gas-house coke costs $2.50 a ton, and repairs are exceptionally low. The total cost per ton of ore can not therefore aggregate 80 cents, or, on the ton of 50 per cent matte, about $10, or for ingot copper, say, one cent per pound.

Of the numerous methods of treating the cupriferous cinders by the wet way, especially those known to contain, besides gold and silver, variable proportions of nickel, cobalt, arsenic, antimony, and tin, the best and in the end the cheapest is in our opinion that recently introduced and patented by Messrs. T. Sterry Hunt and James Douglass, Jr., fully described by one of the inventors in a paper on "The Hydro-Metallurgy of Copper and its Separation from the Precious Metals," read before the American Institute of Mining Engineers in June, 1881, and published in Volume X. of its Proceedings, pages 11–25.

It is based upon the reaction between sulphurous acid and a solution of protochloride of copper, which gives rise to insoluble dichloride, with the elimination of one half the chlorine in the form of chlorhydric acid and the simultaneous formation of sulphuric acid, as expressed in the old notation by the formula,

$$2CuCl + SO_2 + HO = Cu_2Cl + HCl + SO_3.$$

The resulting acid solution when brought into contact with oxide of copper (cupric oxide), will take up as much copper as it originally held, which may, in its turn, be thrown down by sulphurous acid. In this way, the solution of copper from an oxidized ore, and its precipitation as dichloride, may be continued indefinitely, provided chlorine be supplied each time by a sufficient amount of some soluble chloride.

The sulphurous acid required is obtained from the ordinary kilns, and is conducted to the precipitating vats by lead pipes and drawn through the copper-holding solution by an aspirator. The chlorine, derived in the first place from the addition of a portion of salt, is used over again by restoring to the solution the protochloride of iron or chloride of calcium got from the dichloride of copper, only so much salt being added from time to time as is necessary to replace the loss in working, which is small if care be taken to save the chloride solutions produced in the precipitation.

When the insoluble dichloride of copper has been obtained by the routine fully described and illustrated in the paper above referred to, it is washed with water to remove the acid liquor with which it is moistened, and which is liable to carry arsenic and other impurities. Thus washed, however, it is absolutely pure, the sulphurous acid being unable to separate from the solution any thing but the copper. If metallic copper is to be produced, it is next agitated in a large barrel with scrap iron and a sufficiency of water, whereas if the dinoxide is desired the iron is replaced with milk of lime. If metallic copper is thus made there will be an evolution of hydrogen caused by some adhering acid. The barrel must, therefore, be provided with a valve to be opened mechanically at each revolution and so permit the gas to escape. The precipitation by lime is rapid and bulky, and is best collected and pressed into slabs in a filter press, so as to insure the complete elimination of all chloride liquors.

When completely dried these slabs will be sufficiently solid to be smelted in a cupola-furnace to metallic copper of great purity.

The solutions of protochloride of iron or of chloride of calcium thus produced are preserved for chloridizing fresh quantities of the copper solution. Both the cement copper and the dinoxide of copper must be washed clean of chlorides before being smelted. If chloride of calcium be used, when it is added to the copper solution, a crystalline precipitate of sulphate of lime will rapidly form, which should be allowed to subside before transferring the copper solution to the reducing vats. Being a pure sulphate of lime, it is in many places not without commercial value.

It is well known that by the addition in the furnace to argentiferous and auriferous copper cinders of a suitable quantity of common salt these precious metals become chloridized. If care be taken when treating such material for the extraction of its copper, and before the action of the sulphurous acid, to add no more chloride solution to the liquor than is necessary to form dichloride with the copper present, the resulting acid liquor will take up none of the silver or gold. When the removal of the copper by leaching has been completely effected, these may consequently be extracted from the residues in the vats, either by amalgamation with mercury or the use of chlorinated brine.

A properly constructed plant for the application of this or any other wet method of copper extraction is naturally expensive, much more so than a furnace plant of the same capacity. A wet process should therefore only be thought of when there is a sufficiency of suitable ore, and when it has been proved beyond doubt that smelting is not possible. As we have already remarked, there are many cases in which by solution very large amounts of gold and silver are economically extracted, which if passed through a furnace would be completely wasted.

We have now reached the end of this preliminary branch of our great subject, and, written as they have been, in the brief intervals snatched from our professional occupations, we are imbued with a profound sense of the crudity of these essays. The main object, of course, has been to excite interest in the student and thereby provoke a desire for more exhaustive and more systematic research, and if we have succeeded in no more than this we are content to leave the rest with the writings of Scheurer-Kestner, Winckler, Bode, Lunge, Hurter, Dreyfus, Lomas, Mactear, and other authors of similar distinction. That much study and reflection are essential in our present position will not be disputed when we explain that our exhaustive and patient inquiries throughout the entire country have shown that during the year 1886 there were only burned for acid making—

112,000 tons pyrites (from all sources), with net average of 40 per cent =	44,800 tons sulphur.
90,200 tons brimstone (from all sources) =	90,200 " "
Total available sulphur	135,000 tons.

If we reduce the whole of this by calculation to the basis of 50 Beaumé, it may be assumed that the entire production of chamber acid was 307,500 tons. Of this quantity, a trifle over $\frac{6}{10}$ths went either directly into fertilizers or, after being concentrated, into the refinement of petroleum, the remainder being practically speaking used as monohydrate, for making explosives, or directed into various smaller channels of consumption.

The figures and the facts speak for themselves; they demonstrate more eloquently than could any words of ours, that our chemical industry in the generally accepted sense of that term is virtually a dead letter, and such a fact may be justly regarded as a blot upon our otherwise brilliant record, of a progress without precedent in the history of nations.

TO BE CONTINUED.

NOTE. The editors will be glad to receive contributions or criticisms upon any points connected with this work. They cordially invite correspondence from practical men, connected with any branch of the trade and interested in its progress.

Iron Brick Paving Stones.—Paving blocks called iron brick are now being introduced by Louis Jochum, of Ottweiler, near Saarbruecken, Germany. This brick is made by mixing equal parts of finely ground red argillaceous slate and finely ground clay, and adding 5 per cent of iron ore. This mixture is moistened with a solution of 25 per cent sulphate of iron, to which fine iron ore is added until it shows a consistency of 38 degrees Baumé. It is then formed in a press, dried, dipped once more in a nearly concentrated solution of sulphate of iron and finely ground iron ore, and is baked in an oven for 48 hours in an oxidizing flame and 24 hours in a reducing flame. The German government testing laboratory for building materials has reported favorably on this brick.

THE REYNOLDS PATENT BLOWING ENGINES.

The very remarkable and efficient engines, represented by our illustration, were designed by Mr. Edwin Reynolds and constructed by Messrs. E. P. Allis & Co., at the Reliance Works, Milwaukee (Wis.), for furnace F. of the Edgar Thompson Steel Works. They furnish the blast to manufacture regularly 419 tons of iron in 24 hours, an altogether exceptional record of any single furnace with an engine of the same size.

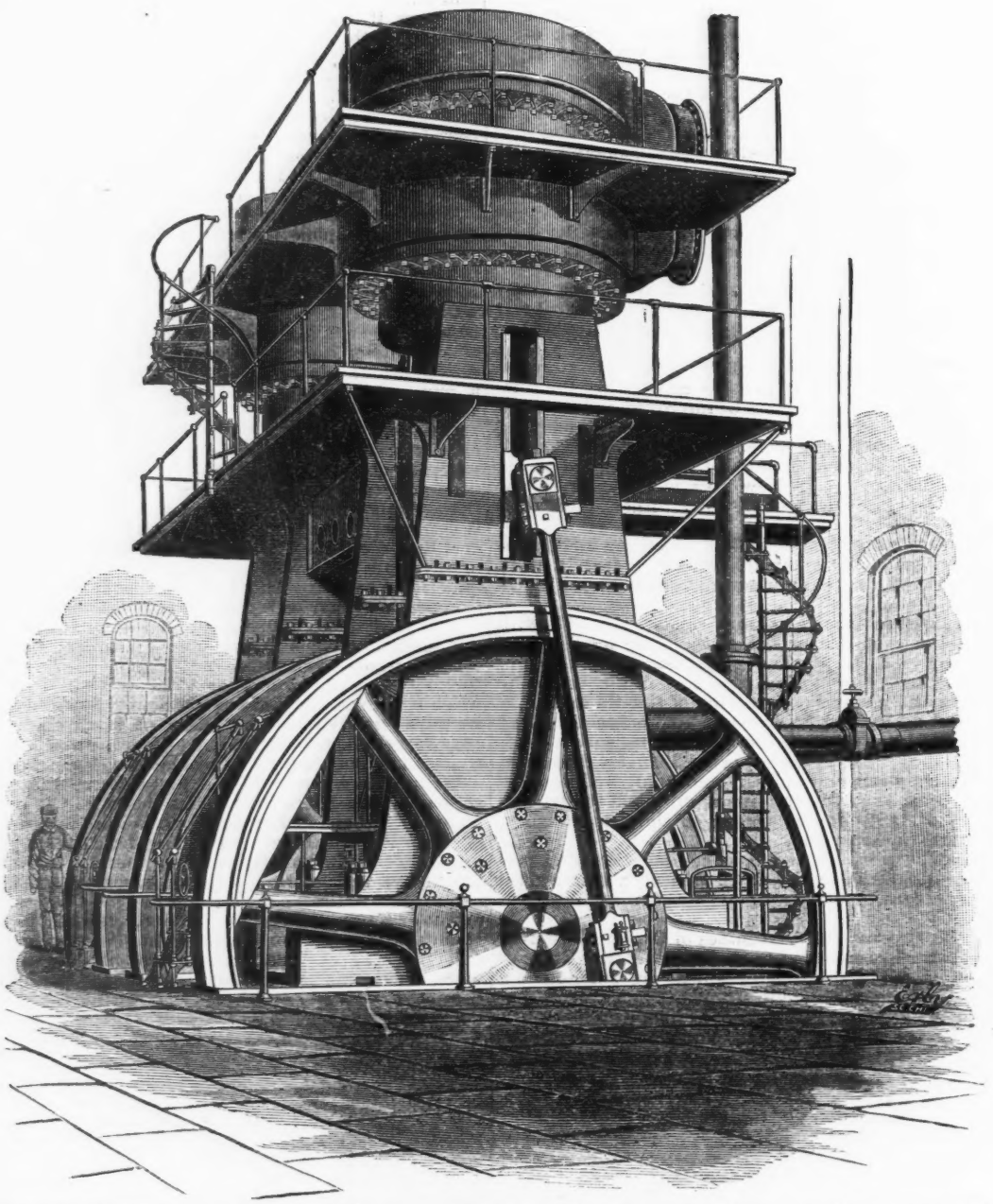
The inlet valves on the air cylinders are made of bronze. The discharge valves and valve seats are made of steel. The discharge valves are faced with a semi-elastic material, which forms a perfectly air-tight joint when they are seated. These elastic rings are movable; they can, thererore, be replaced when one becomes worn or broken. Any of the valves are easily accessible for removal and repairs, each independent of the other.

The steam cylinder is placed between the side frames, which rest on a very heavy cast-iron bed plate.

The Reynolds valve-gear is employed on the steam cylinder and is controlled by an adjustable speed regulator. This can be adjusted by the engineer to suit any pressure or capacity required. The entire machine is designed to withstand hard and continuous service.

Mr. H. S. Smith, General Superintendent of the Joliet Steel Company's mill at Joliet, Ill., alluding in a recent letter to the working of these blowing-engines, says: "In February, 1886, an opportunity occurred at our works to make what we consider a very practical test of comparative economy, one of our furnaces being laid off for repairs. The engines of E. P. Allis & Co. and those of another well-known and excellent firm of constructors were run alternately for three hours at a time, and the water pumped into the boilers measured by a counter on the feed pump, the engines being run to displace 23,000 cubic feet of air per minute at a pressure of six pounds per square inch. The average results of several tests show that to do all the work of the furnace, *i. e.*, pump tuyere water, hoist stock, feed boilers, and blow furnace, the E. P. Allis engine required 22,120 pounds of water per hour to be pumped into the boilers and that the other engines required 30,420 pounds of water per hour, a difference of 27 per cent."

This result was considered by Mr. Smith to be so satisfactory that he at once ordered a new blowing engine with a steam cylinder 40 inches by 60 inches, and blowing cylinder 84 inches by 60 inches. This was started in August last, and has been in constant service, night and day, up to the present, without necessitating repairs of any kind, other than the changing of a few of the valves on the blowing cylinder.



THE REYNOLDS PATENT BLOWING ENGINE, BUILT FOR THE EDGAR THOMPSON STEEL WORKS, BRADDOCK, PA.

Electro-Plating with Aluminium.—Mr. Herman Reinbold communicates to the *Jewellers Journal* the following recipe: "Fifty parts of alum, $AlK(SO_4)_2 + 12H_2O$ are dissolved in 300 parts of water, and to this 10 parts of chloride of alumina (Al_2Cl_6) are added, heated to 200 degrees and cooled, whereupon 39 parts of cyanide of potassium are added. The object to be plated has to be cleaned, and to be absolutely free from grease in any form, whereupon it is suspended in the bath over the electro-positive electrode, the plate of metallic aluminium to be suspended on the negative pole. The electric current ought to be weak. The plating when polished will be found to be equal to the best silver plating, having the advantage of not being oxidized or getting black when brought into contact with sulphurous vapors, which would make it especially valuable for plating spoons and tableware."

The Reduction of Alumina.—According to G. A. Faurie in the *Comptes Rendus*, two parts of very pure and finely powdered alumina are made into a paste with one part of petroleum. This paste, well beaten up, is mixed with one part of sulphuric acid. When the yellow color is uniform and the mass homogeneous sulphurous acid begins to escape. The paste is then wrapped up in paper and thrown into a crucible heated to full redness, above 800 degrees, so as to decompose the petroleum. The flame is allowed to escape and the crucible is cooled. The compact product obtained is carefully powdered and mixed with an equal weight of a metal in powder. This mixture is placed in a graphite crucible, well

closed, and the crucible is heated to whiteness in a blast furnace. It is then cooled and opened. Among a black metallic powder there are found grains and alloys of aluminium. This process is applicable also to silica, lime, magnesia, etc.

Influence of Silicon on the Properties of Steel.—The report of the British Association Committee on this momentous question states that the following are the results of the first series of experiments: On adding silicon to the purest Bessemer iron, the metal is originally red short, especially at a dull red heat, though it works well at a welding temperature; the red shortness is increased by silicon. Silicon increases the elastic limit and tensile strength, but diminishes the elongation and the contraction of area, a few hundredths per cent, having a remarkable influence in this respect. The hardness increases with the increase of silicon. With 0·4 per cent of silicon and 0.2 per cent of carbon, a steel was obtained difficult to work at high temperatures, but tough when cold, capable of being hardened in water, and giving a cutting edge which successfully resisted considerable hard usage.

The Saccharification of Starch.—Dr. J. Effront, writing in the *Moniteur Scientifique*, says that the progress of the transformation of starch into sugar and dextrine differs according as it is effected by means of malt, or by means of an acid. In saccharification by malt the starch molecule is split up into dextrine and maltose. Saccharification by an acid is characterized by the transformation of starch into dextrine, and that of the latter into glucose. The dextrines obtained by these two methods are not identical. Those resulting from saccharification by malt are polymeric; those resulting from the acid process are not so, but all have always the same rotatory power. In the acid process there is always formed maltose to the extent of 34 to 38 per cent of glucose. In saccharification by malt the formation of glucose is not regular. In liquids of low specific gravity glucose is formed if the infusion of malt employed is turbid. Dextrine is obtained in a state of purity on destroying the sugar by the lactic fermentation. For analyzing the products of the saccharification of starch the author proposes a method which consists in destroying the sugar by ammonia and sodium hypochlorite, and determining the dextrine by the deviation of the liquid before and after treatment.

The French Alkali Trade.—The eastern departments of France are fortunate in the possession of extensive deposits of rock salt. In the Meurthe-et-Moselle, where this mineral is chiefly worked, there are no fewer than eleven beds, having an aggregate thickness of nearly 200 feet, all lying within a depth of 270 feet of strata. One of these beds, known as the Saint-Nicolas bed, is 84 feet thick; but only the purest portion, about 15 feet thick, is worked upon. Most of the salt raised is got by mining, the cost amounting to about 60 cents per ton. The produce is treated and disposed of in fourteen salt-works and two soda-factories, one of the latter being the famous Solvay works at Varengéville. With such a supply of salt at hand, and limestone in abundance, the situation of these alkali-works is extremely favorable, and the soda industry accordingly occupies an important position. The manufacture is carried on exclusively by the "ammonia" process due to M. Solvay. By means of this process the cost of soda carbonate has within a very few years been reduced by about 44 per cent. The Solvay works have been greatly enlarged and improved of late, and a further extension is now taking place. The daily output is 200 tons of soda, the consumption of coal being 400 tons.

The New Element, Germanium.—Dr. Clemens Winkler has published an account of his latest work upon the new element germanium recently discovered by him in the Freiberg mineral argyrodite. In his first announcement last year Dr. Winkler stated that the metal was obtained by reduction of the oxide in a stream of hydrogen gas, but since that time large quantities of the mineral have been found and dealt with on a much larger scale. The powdered oxide, after undergoing an elaborate process of purification, is intimately mixed with 15 to 20 per cent of starch meal, made into a paste with boiling water, and rolled into balls. These balls are then placed in a crucible in contact with powdered wood charcoal and heated to redness. On cooling, each ball is found to be converted into a regulus of metallic germanium. After removal of the adhering charcoal they are placed in a second crucible, covered with a layer of powdered borax glass, and melted in a gas furnace, when they fuse together to a single brittle regulus, fine octahedral crystals being formed at the outer surface. Commenting upon this discovery, *Nature* remarks that there can no longer be the slightest doubt that the gap in the periodic table between silicon and tin must be occupied by germanium, for Dr. Mendelejeff predicted that the metal thus filling up this particular gap would be found to form, if discovered, a tetrethide of specific gravity about 0·96 and boiling at 160 degrees.

Rio Tinto Company (Limited).—The directors of this company have just issued their usual brief statement of operations during the current year. It informs us that the deliveries of pyrites under existing contracts have continued to be satisfactory, and indicate an amount of consumption for the whole year of fully 360,000 tons, against 347,000 last year. Pyrites contracts have also been concluded for consumption in this country during the next three years (1888, 1889 and 1890), which, taken along with the contracts for consumption abroad, promise a total delivery of about 400,000 tons per annum, at the same prices for sulphur, and on the same terms and conditions as those now running. The production of copper at the mines is more than maintained. With the increase in this department, the earning power of the company is not less than it was last year, notwithstanding that the prices realized for copper have averaged £1 per ton lower. Since the annual general meeting, arrangements have been made for the floating debt, without the necessity of making any public issue, and within the powers of the board under the statutes of the company. An interim dividend of 3s. per share, free of income tax, is now declared, payable on the 12th November next. The share transfer books will be closed from Friday, the 4th, to Friday, the 11th November, both days inclusive. The share warrant coupon to be presented is No. 18.

Manufacture of Sulphuric Acid.—An apparatus has recently been patented by Mr. W. Burns, of Leith, Scotland, for the manufacture of sulphuric acid under high pressure by an entirely new method. Sulphur is burned in an iron retort lined with fire-brick and provided with gas-tight lids at the top and bottom. Air is forced into the retort and forms sulphurous acid, which is carried away by a pipe and mixes with nitrous acid gas obtained by the decomposition of nitrate of soda. The gases are passed through a condenser, where they deposit any sulphur that may have been carried over, and are then mixed with the requisite quantity of air. The mixer consists of an inverted cone made of iron and lined with lead or enamel, the nozzle of which dips into a glass or stoneware basin. The combined gases and air pass through this mixer, together with a jet of high pressure steam, and then enter a large cylinder, where they are deflected downwards by a glass plate on to the surface of sulphuric acid contained in a basin, and where the greater portion of the gases combine and form sulphuric acid, which falls to the bottom of the cylinder. The uncombined gases ascend and pass through a series of agitators, and are also converted into sulphuric acid. We are very curious to know whether the inventor has any likelihood of seeing his method employed on an industrial scale? We have no wish to discourage him, but must nevertheless confess that we have little confidence in its adoption and success. What advantage does it possess over the present system of burners and lead chambers?

The Chemistry of Shale Spirit.—Shale spirit has recently been examined by Messrs. Miller & Baker, and found to be rich in paraffins and the higher members of the olefine series. It is produced at a much lower temperature than oil gas, and the removal of hydrogen from the original hydrocarbons has apparently not been carried so far. Shale spirit by fractional distillation can be divided into three fractions, boiling respectively at 75–85 degrees, 120–125 degrees, and 140–145 degrees. Each of these portions contains members of the paraffin series of hydrocarbons to a considerable extent, in some cases to as much as 50 per cent. Olefines are also present in fair quantity, and the remainder consists of less saturated hydrocarbons, probably of similar constitution to those already referred to as existing in the oil gas products, but which have not yet been further investigated. They are characterized, however, by forming bromine addition products which differ from the corresponding compounds formed with the olefines in being for the most part decomposed, when distilled in a current of steam, into compounds of a tarry nature. The olefines which have been examined are easily separated by fractionation of the pure compounds obtained by the reduction of the bromides with the copper-zinc couple. By oxidation with potassium permanganate the corresponding fatty acids have been prepared, and in this way it has been shown that in addition to the lower olefines which are present in the oil gas residues, both octylene and nonylene exist in shale spirit. The chemistry of these shale products is at present in a very imperfect condition; but the subject is one of great importance, as there can be no doubt that a thorough examination of the conditions under which hydrocarbons of known composition are produced at different temperatures from shale oil and petroleum will throw light on many processes, such as that of coking coal, the preparation of valuable benzine compounds, and illuminating and heating gases, which are at present only imperfectly understood. When the composition of the Russian and American natural petroleums is better known, it may be possible, from a study of the genesis of hydrocarbons at high temperatures, to ascertain approximately the internal temperature of the earth in the different localities necessary to produce petroleums of such composition. Systematic organic chemistry may thus help the progress of geological investigation.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book-buyers, give the retail price? These notices do not supersede review in another part of the Journal.]

Transactions of the American Society of Mechanical Engineers. Vol. VIII. Published by the Society. New York. 1887. Pages 744 and Index. Illustrated.

The Manual of Lubrication. By Louis Simpson, Manchester, England. Published by the Oil, Paint and Drug Publishing Company. New York. 1887. Pages 99 and Index. Price, $2.

Petroleum and Inflammable Gas. By Edward Orton, State Geologist, Columbus, Ohio. Published by A. H. Smythe. Columbus. 1887. Pages 200 and Index. Illustrated. Price, $1 in paper cover, $1.25 in cloth.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED OCTOBER 25TH, 1887.

371,936. Electric Railway. John Hartman, Jr., Philadelphia, Pa.
371,946. Gas Pressure Regulator. Peter Keller, New York, N. Y.
371,956. Apparatus for Making and Burning Gaseous Fuel. Joseph Locke, Glenwood, and Solon O. Richardson, Jr., Wakefield, Mass.
371,961. Sheet Metal Shears. James H. Mason, Chicago, Assignor of one half to George F. Watson, Aurora, Ill.
371,965. Hauling-Through Conduit System. James F. Munsie, Chicago, Ill.
371,968. Earth and Rock Drilling Machine. Emanuel W. Poorman, Canton, O.
371,978. Apparatus for Manufacturing Heating and Illuminating Gas. James Roberts, New York, N. Y., Assignor to the Acme Liquid Fuel Co., same place.
372,013. Brake for Hoisting Engines. Nicholas B. Cushing, Jersey City, N. J.
372,036 Gas Cut-Off Fred M. Margach, Meadville, Pa., Assignor of one half to Frank Roueche, same place.
372,040. Sluiceway and Flood Gate. Thomas Parker, Menominee, Wis.
372,047. Rotary Water Meter. John Thomson, Brooklyn, N. Y.
372,072. Motor and Vacuum Engine. William M. Horne, Meriden, Conn.
372,078. Underground Electric Conductor. Henry Metzger, Pittsburg, Pa.
372,086. Motor. John G. C. Rank and Erdmann Rank, St. Paul, Minn.
372,087. Phosphatic Fertilizer. Jacob Reese, Pittsburg, Pa.
372,143. Rock or Well Drilling Machine. Charles Harman, Tiffin, Ohio.
372,154. Method of Drilling Rock. Albert Krause, Buffalo, N. Y.
372,176. Rock Bars for Furnaces and Means for Operating Them. John Settle, Bolton, County of Lancaster, England.
372,208. Electric Valve Controller. Simpson W. Dermitt and Wesley V. Dermitt, Pittsburg, Pa.
372,231. Regulator for Electric Motors. Alex. W. Meston, St. Louis, Mo., Assignor of one half to J. H. Clark, same place.
372,238. Apparatus for the Manufacture of Heating and Illuminating Gas. James Roberts, New York, N. Y.
372,273. Railroad-Rail and Conduit for Electric Wires, etc. James T. Nulty, Philadelphia, Assignor of five eighths to Joseph Messick and Thomas J. Crumbie, Chester, Pa.
372,276. Machine for Shaping Heads of Screws. Charles F. Roper, Hopedale, Assignor to Frederick P. Fish, trustee, Cambridge, Mass.
372,277. Screw Nicking Machine. Charles F. Roper, Hopedale, Assignor to Frederick P. Fish, trustee, Cambridge, Mass.

REISSUES.

10,877. Pipe-Coupling. Alfred Wilbur, Allegheny City, Pa.

THE METALLURGY OF STEEL.*

By Henry M. Howe.

(*Continued from page 297.*)

The alloys of iron with a larger proportion of aluminium appear to be brittle, and hold out little promise.

B. Mitis Castings.—Without special additions non-carburetted iron evolves gas so copiously in setting that its castings are very porous: its freezing point is so high that, even when cast at the highest temperature ordinarily attainable, it sets so rapidly that it can only be cast into rather thick forms: yet, if ·05 to ·1% of aluminium be added just before teeming, it yields solid castings of astonishingly attenuated shapes, and still retains its great ductility. So says P. Ostberg, and one most trustworthy metallurgist assures me that a slight addition of aluminium does check the escape of gas from non-carburetted iron, and another that it renders it extremely fluid.[a] Indeed, the remarkable castings which Ostberg has exhibited, and which he assures us have not been annealed, combine the ductility of the most carbonless iron with the thinness and solidity of the most carburetted and brittle castings. Such additions of aluminium, however, appear to render molten carburetted iron thicker rather than thinner.[a]

Note that we have two distinct effects, increased fluidity, and increased solidity and freedom from blowholes. These are not necessarily connected, or dependent on the same proximate cause.

What now is the rationale of these effects of aluminium? Ostberg states that the presence of ·05 to ·1% of aluminium lowers the melting point by say 300 to 500° F.: hence the thin castings. Further, that it is while being raised from its melting point to a temperature enough higher to permit casting that steel acquires the gases which it later evolves while setting, and that the addition of aluminium immediately after fusion, depressing the melting point, enables us to teem at once, and so nearly eliminates the opportunity for absorbing gases. Finally, aluminium renders the metal so fluid that it releases what gas it has, which, in his view, appears to be entangled as in a net. He speaks, however, with a degree of positiveness which neither his nor our present knowledge justifies, and which awakens suspicion.[b] I vainly request his evidence: without it such statements carry no weight.

Now (1) it is not shown that the melting point is actually lowered in the mitis process; (2) there is, moreover, reason to doubt that aluminium even tends to produce this specific effect of lowering the melting point; and (3) were it known to lower the melting point too little of it is present to plausibly explain a fall of the melting point sufficient to account for the startling effects produced. (4) Finally, a fall in the melting point is incompetent to explain all the phenomena. In brief, our aluminium is not shown to be qualitatively competent and is shown to be almost certainly quantitatively incompetent to explain the phenomena in this particular way. The following paragraphs evidence these statements seriatim.

1. A rise in the metal's temperature explains the phenomena quite as easily as a fall in its melting point.

2. I vainly seek in the writings of Deville, Faraday and Calvert and Johnson, who have all investigated the iron-aluminium alloys, any intimation that aluminium lowers the melting point of iron in this remarkable way, a point which these in two cases illustrious observers would hardly overlook. Moreover, as just stated, the addition of ferro-aluminium to molten carburetted steel appears to stiffen it, doubtless by diluting its heat.

3. On diligent inquiry among those best informed, I learn of no determination of aluminium in mitis castings, though several complete analyses by Riley are given:[c] here indeed the presence of aluminium might have been purposely suppressed. Competent chemists have vainly sought it in them: Davenport could find it in no instance: and I am credibly informed that Ostberg admits that it has never been detected. The effects described are produced even when only 0·06% of aluminium is added. Now the proportion of aluminium actually present in common steel often varies from 0 to 0·034%, without producing any noticeable effect: are we to believe that the further addition of another 0·03% is to so intensely affect the properties of the metal? It may indeed be questioned whether even this amount remains in the mitis casting: for aluminium, though difficult to oxidize at low temperatures, oxidizes readily at higher ones, and it may well be oxidized by the oxygen of the oxygenated metal which forms the basis of these castings.[d]

If it be present why does no one find it? The analytical methods are not perfected? Perhaps not for 0·001% of aluminium. But so eminent an analyst as A. A. Blair, who has given the subject special attention, informs[e] me that he considers it impossible that 0·03% of aluminium should escape detection when properly sought in iron or steel, and that the limit of error should not exceed a few

* Copyright by the Scientific Publishing Company, 1887.

[a] Trans. Am. Inst. Mining Engrs., XIV., p. 773, 1886. R. W. Davenport has personally conducted direct comparative tests under rigidly similar conditions, which leave no doubt as to this effect of aluminium. A large charge of unrecarburized, non-carburetted, wild, effervescing ingot iron, holding about 0·08% of carbon, was apped from an open-hearth furnace simultaneously into two similar ladles, into each of which small red-hot lumps of ferromanganese were thrown at the same time, introducing 0·7 of manganese per 100 of steel, while one ladle also received 1 of ferro-aluminium, or sufficient to introduce ·064% of aluminium, ·024% of silicon and 0·01% of manganese. After a few minutes both lots were teemed into similar sand castings of a few hundred pounds weight each, and into common ingot molds. The aluminium-treated steel lay perfectly dead and "piped" in the ingot molds, and yielded a practically solid sand casting: the other rose in the molds and had to be stoppered, and yielded a very porous sand casting.

On another occasion he added 1% of ferro-aluminium, or enough to yield ·04 of aluminium and ·10 of silicon per 100 of metal to both oxygenated rising metal obtained by melting wrought-iron alone in crucibles, and to crucible steel which, owing to the presence of carbon and manganese, evolved no important quantity of gas. This addition prevented the evolution of gas from the former, making it pipe when teemed, and appeared to thin it, or at least it poured easily: but it appeared to stiffen the latter and to make it hard to pour. In no case, however, has he been able to find aluminium in the castings themselves (Private communication, Sept. 10th, 1887.)

[b] He states unreservedly that to gradually heat steel above its melting point as in "killing" is most injurious: that practically no gases are absorbed by solid steel, (though Parry has observed by direct measurement that gray cast-iron absorbed 14 times its own volume of hydrogen at bright redness and 22 times its volume at whiteness; the volume of gas being measured at the usual temperature Journ. Iron and St. Inst., 1874, I., p. 94): and that increasing the fluidity of molten iron causes it to evolve its gases. Here he asserts what is probably false, now what is only conjecturable or at best probable. His further statement that, apparently in two or three years, the mitis inventors have had time to conduct the most exhaustive and elaborate experiments with every conceivable metal, metalloid and alloy, certainly does not indicate a careful weighing of words. The previous protracted labors of many a physicist and metallurgist, probably collectively representing scores of years, had been able to conquer exhaustively but a fraction of this ground. As Davenport finds that silicon gives at least approximately as good results as aluminium, some may infer that Ostberg regards silicon as in some sort inconceivable.

[c] Pamphlet of the United States Mitis Company, containing what purports to be a paper read by T. Nordenfelt before the British Iron and Steel Institute, May, 1885: yet strangely enough I have been unable to find in the journal of that society any reference to such a paper: the words "Mitis" and "Nordenfelt" are not even indexed in its journal for 1885 and 1886. Ostberg (loc. cit.) refers to this paper as "read before the British Iron and Steel Institute."

[d] According to Deville aluminium does not decompose metalic oxides at a red heat: an alloy of aluminium and copper yields cupric oxide when heated in a muffle: an alloy of lead and aluminium can be cupelled. But above redness aluminium takes the properties of silicon and reduces the oxides of copper and lead, yielding aluminates.

[e] Private communication, September 29th, 1887.

thousandths of one per cent. Can we believe that enough aluminium remains to influence the physical properties appreciably? Must we not rather conclude that it is almost or quite wholly scorified? and if scorified, can we believe that the fact of its former brief presence can alter the melting point after its departure? The supposition appears to me utterly absurd.

5. A fall in the melting point, by increasing the fluidity, enables the gases present to escape? Then when, as in Davenport's experiment, already boiling metal receives ferro-aluminium, it should immediately boil the more tumultuously: actually it at once grows quiet. Hence the ferro-aluminium clearly acts by enabling the metal to retain in solution gas which otherwise would have continued to escape, and not by promoting its release. And this is a direct consequence of a lowered melting point? Or perhaps of the conjunction of some planets?

Davenport's Explanation[a] is that the aluminium attacks the oxygen present in the oxygenated metal, its combustion raising the temperature. This is indeed qualitatively competent to explain why oxygenless carburetted steel is stiffened while oxygenated metal is thinned by ferro-aluminium; and as the addition of 0·06% of aluminium might remove 0·47% of ferrous oxide by such a reaction as

$$2Al + 6FeO = 3FeO, Al_2O_3 + 3Fe$$

and as the removal of this quantity of ferrous oxide might well check the evolution of gas, it may be regarded as quantitatively competent to explain the quieting effect.

But is the combustion of the small quantity of aluminium employed quantitatively competent to raise the temperature of the metal enough to account for its increased fluidity? Calculemus. I know of no determination of the calorific power of aluminium, but, if we take it as 10,000, and it is not likely to be higher, then the ·06% employed by Davenport would generate 610 calories for each 100 kg of metal, which would raise the temperature by 40° C, assuming its specific heat as 0·16, or say one twelfth as much as it rises in the Bessemer process. The heat thus evolved is on the one hand lessened by that absorbed by the simultaneous deoxidation of the iron, whose oxygen the aluminium seizes, and on the other increased by that evolved by the union of alumina with the residual ferrous oxide. Moreover, by stopping the escape of gas, the aluminium prevents a small quantity of heat from becoming latent through vaporization. Finally, the radiation of heat is somewhat slower from a quiescent than from a bubbling liquid, as they know who stir their soup. All things considered, it may not be unreasonable to claim that, directly and indirectly, our ·06% of aluminium may raise the temperature of our steel by from 30° to 50° C. (54° to 90° F.) which may be considered sufficient to account for the increase of fluidity, which was probably not great: for Davenport speaks of it very guardedly as "an apparent increase" only. A rise of 120° C. (216° F.), which would imply the combustion of only 0·18% of aluminium, might well account even for the extreme thinness of Ostberg's castings: and this quantity may easily have been added to them.

Now the attenuated castings testify that the ingot iron which composes them was unusually far above its freezing point when cast: either its freezing point was lowered (Ostberg's theory) or its temperature raised by the aluminium (Davenport's). The former theory is untenable: the latter is made to account for all the phenomena by a series of assumptions which, while in no case preposterous, perhaps not even unreasonable, still by no means command acceptance. Davenport's theory, then, immeasurably the less improbable of the two, may be guardedly accepted as a working hypothesis.

C. Aluminium in Commercial Iron.—Though the direct reduction of alumina by the usual reducing agents, hydrogen and carbon, is extremely difficult, Faraday and Billings seem to have effected its reduction in presence of a great excess of iron by means of carbon. Hence the frequent presence of small quantities of aluminium in commercial cast iron is hardly surprising. Difficultly oxidized below redness, at higher temperatures it behaves like silicon: and, like silicon, a little of it may survive the oxidizing processes of refining and be found in the resulting steel or wrought-iron. A. A. Blair has examined very many irons and steels for aluminium, which he reports "nearly always exists as such in steel," but he has never found more than a few thousandths of one per cent, say ·032%. He has been unable to connect its presence with any peculiarity in the properties of the metal, or with any particular mode of manufacture.[b]

Percy quotes and questions an analysis of cast-iron containing 0·97% of aluminium.[c] Part of the aluminium of cast-iron probably exists as alumina in slag. Karsten detected but traces of aluminium in iron and steel, and those rarely.[d] Alumina, which he added to cast-iron which was being refined in the charcoal hearth, was wholly slagged.[e]

§ 150. Mercury does not amalgamate with iron directly, hot or cold, but, by immersing sodium amalgam in ferrous sulphate solution and probably by other indirect means, iron amalgams apparently of feeble stability may be formed.[f]

§ 151. Faraday and Stodart stated that "the metals which form the most valuable alloys with steel are silver, platina, rhodium, iridium and osmium, and palladium."[g] The scanty subsequent investigations into this group of alloys have not tended to confirm their statement. With to-day's knowledge of the influence of other elements on iron they would probably have interpreted their observations quite differently.

(A.) Iron and Platinum appear to combine readily in all proportions, platinum melting even below the fusing point of steel when in contact with that metal. Their alloys are considered of no technical importance, Faraday and Stodart to the contrary notwithstanding. Melting Indian steel and 0·99% of platinum they obtained an alloy which, though not so hard as that obtained by melting the same steel with 0·2% of silver, was considerably tougher, and they prophesied its extensive use in spite of the cost of platinum.[h] Their prophecy is not yet fulfilled.

(TO BE CONTINUED.)

NOTE.—The publishers of the ENGINEERING AND MININ JOURNAL will thank the readers of this article if they wil promptly call attention to any inaccuracies they may observ in it.

[a] Private communication, ante cit.

[b] Private communication, May 10, 1887: Rept. of U. S. Board Test on Tes n Metals, II., p. 590. Am. Jl. Science, XIII., p. 424, 1877: Thurston, Matls Engineering, II., p. 434.

[c] Percy, Iron and Steel, p. 542.

[d] Idem, p. 185.

[e] Corbin (Silliman's Journal, 2d Ser., XLVIII.,p. 348, 1869), reports 2·38% aluminium with 1·66% chromium and ·98% carbon in chrome steel; but this is hardly credible. Blair finds no more aluminium in chrome than in other steels.

[f] Percy, op. cit. p. 174.

[g] Phil. Trans. Royal Society, 1822, p. 254.

[h] Phil. Trans. Royal Society, 1822, p. 257.

Correction.—Page 297, second column, third line, reference "d" should be "o"; page 297, second column, foot note, references "u" and "v" should be transposed.

PERSONAL.

Mr. J. B. Knight has been elected Inspector of Mines of Menominee County, Mich.

Mr. W. E. Newberry has been appointed Superintendent of the Enteprise Mining Company, Aspen, Colo.

Mr. Geo. N. Thatcher has been appointed Superintendent of the Compromise Mining Company, Aspen, Colo.

Mr. J. Parke Channing, mining engineer, Bessemer, Mich., has been elected Mine Inspector of Gogebic County.

Colonel Havens has retired from the management of the Idahoan mine, Bullion, Idaho, and Mr. Edgington, a heavy stockholder, has succeeded him.

Major Alfred Mordecai, Secretary of the Pennsylvania Canal Company since 1861, died on the 23d inst., at Philadelphia, aged eighty three years.

Mr. E. S. Ingraham, for fourteen years Secretary of the Brotherhood of Locomotive Engineers, was re-elected at the recent meeting held at Chicago with scarcely any opposition.

Mr. William Reed, of Pittsburg, Pa., who was a well-known mineral and oil prospector, was drowned at Somer's Point, N. J., on the 25th inst., where it is said he was searching, with the aid of a divining rod, for treasure lost on a wrecked vessel some years ago.

Mr. Henry Merry, late of the Jackson mine, Escanaba, Mich., has accepted the position of general superintendent of the Low Moor Iron Company, Low Moor, Va. He is one of the pioneer miners of the Northwest and will fill the place of the late Col. H. W. Goodwin.

Mr. George P. Cowles died on the 20th inst., in this city, aged seventy-one years. He was the president of the Ansonia Land and Water-Power Company, and of the Birmingham Water-Power Company; vice-president of the Ansonia Brass and Copper Company, and treasurer of the Ansonia Clock Company, all large concerns with which he had been identified since their organization.

Mr. John B. Cornell, the senior partner of the firm of J. B. & J. M. Cornell, iron manufacturers, of this city, died on the 26th inst., aged sixty-six years. The business in which Mr. Cornell was interested was established forty years ago, and for many years the firm filled all the city contracts for iron work, and supplied the iron for the new Court-house and for the elevated railroads in New York City.

Our contemporary, the *Journal des Mines*, one of the oldest of French mining papers, comes to us this week transformed from eight into sixteen pages. It is now under the direction of Mr. F J. Seaver, F.R.S. Edinburgh, late Government Inspector General of Mines, assisted by a numerous and competent staff. We heartily congratulate the *Journal* upon its new departure and wish it all the success it will undoubtedly try to deserve.

Mr. Jesse R. Grant, the youngest of General Grant's sons, has gone to California to look after a number of mining properties in which he has become interested with and through Julius Lezynsky, by whom he was accompanied on his trip. Mr. Lezynsky has bought out five gold mines on the Pacific Coast, among them the mines of the Hector Consolidated Gold Mining Company, within six months and placed them on the market in one shape or another, Mr. Grant being, it is said, associated with him in all the ventures.

FURNACE, MILL, AND FACTORY.

A company composed of Ashland, Ky., capitalists has been organized to erect a large stove-foundry at that place.

A battery of six boilers exploded at the Lawrence Iron-Works, at Ironton, Ohio, on the 24th inst., killing four men and injuring about thirty others.

Iron River Furnace, of the Iron River Furnace Company, at Iron River, Mich., has resumed operations after a period of idleness, under the management of Mr. R. Hunt.

A company has been organized at McDonald, Pa., with a capital of $75,000, for the purpose of building a foundry and machine shop to manufacture the Edney coal mining machine.

The Denver Fire-Brick Manufacturing Company, Denver, Colo., is putting in a large amount of new machinery. This firm now makes every thing that can be made out of fire-clay.

The Ashland Furnace No. 1, Ashland, Ky., is banked while connections are being made with the No. 2 just completed. The No. 2 is to have an output of 75 tons per day, using Bath County ore and hard coal.

The Phosphor-Bronze Smelting Company, Limited, of Philadelphia, Pa., offers its phosphorized anti-friction metal as a first-class article for heavy pressure and high speed. It is used in the same manner as Babbitt metal.

The sale of the plant of the Northwestern Car Company, of Stillwater, Minn., took place on the 27th inst. The works were purchased by the Minnesota Thrasher Company for $1,105,000. The Porter party, the only other bidder, dropped out after bidding $1,103,000.

In the case of Ferris Giles, one of the persons injured in the ruins of the Diamond State Iron Company finishing mill, which blew down on July 28, 1885, the Court of Errors and Appeals at Wilmington, Del., on the 27th inst., confirmed the verdict in the court below, which gave Giles $5,000 damages. This also determines the case of William Gessam, another victim, who got a verdict for $10,000.

The Continental Steel Car-Wheel Company has been organized at Norristown, Pa., for the manufacture of rollled steel car wheels, under letters patent issued to Col. Theodore W. Bean. The manufacture of steel car wheels has not been attempted as yet, but according to the statements of those interested in this new enterprise the project is entirely feasible. The working models are all complete, and a location for the plant has about been decided upon.

One of the new batteries of boilers in the new steel rail mill of Carnegie Bros. & Co., Limited, at Braddock, Pa, and one of the new engines were tested on the 22d inst. This battery of boilers is regarded as one of the finest in the world, consisting of twelve single boilers connected by the most recent improvements. The mill is now nearing completion, nearly all the machinery being in place, and consists throughout of all the most modern improvements, and is claimed to be the finest steel rail mill in the world. It is expected to be in operation by January 1st, 1888.

The only furnace in blast at Andover Iron-Works, Phillipsburg, N. J., has been blown out, owing to its having become slagged. This trouble was brought about by the poor quality of the coal obtained at other mines since the strike in the Lehigh region. All the material in the stack will have to be dug out. Not long ago the furnace turned out 1450 tons of iron in two weeks, which was one of the best records ever made by any furnace in Lehigh Valley. The company has another furnace, which it expects to put in blast in about two months.

CONTRACTING NOTES.

Contracts Open will be found on pages xix and xiii New contracts this week: No. 597, Two Iron Bridges; No. 598, Water Tunnel; No. 599, Iron Bridge; No. 600 Street Lighting; No. 601, Removal of Wreck; No 602, R moval of Wreck; No. 603, Two Pumping Engines; No. 604, Iron Bridge; No. 605, Iron and Steel Work for Bridge Superstructure; No. 605, Supplies, Cement, Stone, etc.; No. 606, Work at Croton Aqueduct.

A contract has been made to light the streets of Paris, France, with the Edison electric lamps, 200,000 of which will be required.

Mr. Robert Grimshaw, of No. 5 Dey steeet, New York City, is in the market for wood-working machinery for making wooden tackle blocks.

The Indianapolis Natural Gas Company, Indianapolis, Ind., has contracted with the National Tube Works Company, of McKeesport, Pa., for 20 miles of pipe, to be supplied as soon as possible.

The contract for furnishing new scales, beams, weights and other weighing apparatus required in the customs service during the fiscal year ending June 30th, 1888, has been awarded by the government to Fairbanks & Co., of New York.

The Star Fire-Brick Manufacturing Company, of Pittsburg, Pa., has just received a contract for 50,000 fire-bricks, to be shipped to Mexico. These bricks are for a new charcoal blast-furnace, one hundred miles from the nearest railroad. From that place they will have to be hauled in wagons at a cost, it is said, of $250 a thousand.

The Westinghouse Electric Company, of Pittsburg, Pa., has been awarded the contract for lighting the Senate Chamber of the Capitol at Washington. This contract calls for 1300 electric lights, which will include all candle power from 9 to 16, 25, 50, 75, 100 and 150. The entire plant will be placed in the building, including the power, machinery and other essentials.

LABOR AND WAGES.

An effort is being made to unite the coal miners throughout the United States into one national organization.

The railroad coal miners in Ohio, Pennsylvania, Indiana, and Illinois will insist upon the payment of the 5 per cent advance, beginning November 1st, as agreed upon at the Inter-State conference of the miners and operators at Columbus, Ohio, last February. One of the operators is reported to have said that it was not proposed to allow Illinois operators to pay a less rate for mining than the operators in the other States, and the advance will not be paid by any unless by all of the operators. A meeting will be held at Belleville, Ill., on the 29th inst., at which an attempt to bring the Illinois operators into line will be made. Even if they do not surrender, the workmen will demand that the other operators pay the advance.

GENERAL MINING NEWS.

Alpha Oil Company.—The Alpha Oil Company, the young rival of the Standard oil monopoly, has made an assignment. Its capital, with that of branch institutions, was $6,000,000. Its leading spirits are the most prominent men of Detroit and Michigan, with a sprinkling of Cleveland millionaires. Judge Isaac Marston is Secretary and Treasurer of the International Oil Company, which has the same patents as the Alpha, the American branch of the organization. He says the International Company is not affected by the troubles of the Alpha Company and that the latter concern will be reorganized and continued. The whole interests of both the International and Alpha companies are founded on the inventions of T. G. Hall, of Chicago, who had his process of refining patented in the United States, Canada, and all the European countries, including Russia. The procuring of these patents cost $200,000. The International Oil Refining Company, of Michigan, was formed in July last. It owns eight-twelfths of the United States and European patents. The Alpha Company on the Canadian side was capitalized for $1,000,000, and on the American side, the branch which depended on the same discoveries of Hall, was capitalized at $5,000,000. The crisis was recently reached. Money had been so lavishly spent that the supply gave out. The wages of workmen were not paid and law suits were begun representing claims of laboring men. The company deeded its property to Mr. Hall for $100,000 and Mr. Hall assigned it to Major Thurber, of Marquette. According to the receipts this leaves Mr. Thurber as practical owner. The outcome will be a matter of great financial moment in Detroit and Michigian. The company has constructed a pipe line to the Canadian oil fields, built immense machine shops, and started a bank to conduct its finances.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including October 19th, as reported by the Marquette *Mining Journal*, were as follows:

	Tons. 1887.	Tons. 1886.
Marquette, Marquette District	724,212	757,899
St. Ignace, " "	84,152	64,656
Escanaba, " "	767,612	540,528
" Menominee District	1,002,679	749,149
Ashland, Gogebic District	958,466	643,011
Two Harbors, Minnesota Iron Company, Vermillion District	344,100	273,627
Total tons	3,881,221	3,028,870

Shipments of Iron Ore, Gogebic District.—Shipments of iron ore from Ashland, Wis., the mines of the Gogebic District, for the season, up to and including October 19th, are as follows:

	Tons.		Tons.
Atlantic	1,318	Norrie	159,153
Anvil	4,581	Odanah	20,071
Ashland	140,819	Pabst	7,907
Aurora	102,098	Palms	1,414
Bessemer	12,402	Pence	1,457
Brotherton	21,277	Puritan	25,939
Colby North	63,641	Sunday Lake	11,724
Colby South	141,465	Superior	21,370
Germania	41,768	Sellwood	2,374
Iron Chief	2,250	Vaughn	2,101
Iron King	42,526	Trimble	15,288
Ironton	23,110	South 15	2,814
Kakagon	44,749	Parker	578
Montreal	24,756		
Nimikon	18,839	Total tons	958,466

The shipment shows an increase of 315,455 tons this year, as compared with the shipments made at the same time last year.

"The Iron Chief, Sunday Lake, Phœnix, George Washington, West Presque Isle and Florence mining properties have been attached by the miners on account of wages. The claims against the first two companies are said to amount to $10,000. There is considerable suffering among the miners, it is said. It is several months since they have received any money, and merchants refuse to give them credit without security. At the offices of Moore, Benjamin & Co., in Milwaukee, it was said that the miners on all their properties took acceptances to mature November 4th and they have no basis for attachment."

ALABAMA.

DE KALB COUNTY.

Fort Payne Land and Improvement Company.—This company has sunk a shaft to the Castle Rock coal seam on Lockout Mountain and found the seam 38 inches thick at the point struck by the shaft. Below the Castle Rock is the Dade seam of coal, which at the point where it crops out is 5 feet 2 inches thick. The company is now sinking the shaft so as to strike also the latter seam.

CALIFORNIA.

AMADOR COUNTY.

Amador Queen Mining Company.—Arrangements are now making to get the matters of this company, to which we referred in our issue of the 15th inst., in shape for final settlement. A proposition has been made to pay the new indebtedness in full and the old indebtedness on a basis of 65 or 70 per cent. It is probable if this indebtedness can be adjusted that the property will change hands.

Maroon.—Work is to be resumed on this coal mine, at Lancha Plana, which is now owned by Stockton parties. An agreement has been entered into to take out 200 tons and forward to Stockton.

Plymouth Consolidated Gold Mining Company.—The report for the quarter ending the 1st inst. shows that the total product for nine months was $570,529.10; operating expenses for same period, $221,950; profit, $348,579.10; addition to Pacific Mill, 40 stamps, $44,324.20; $304,254.90. Surplus October 1st, 1887, $130,334.79.

Having been short of water (on which the company depend for power) for two months past, the Empire mill has been compelled to run on short time, thus reducing the output for August and September below the average. The fall rains are now due, and will soon furnish a full supply. The dividend payable on

October 5th will be the fifty-third consecutive monthly dividend, making a total of $2,120,000 paid the shareholders since the consolidation, June 1st, 1883, being $21.20 per share.

COLORADO.

ARAPAHOE COUNTY.

Messrs. H. Rudge & Co. are erecting furnaces in Denver for the reduction of zinc ores. It is the intention to treat the ore brought to them exclusively for the zinc it contains. There are no works of this kind this side of the Missouri River, and it is thought the manufacture of commercial zinc will be quite profitable.

OMAHA & GRANT SMELTING AND REFINING COMPANY.—During the present year six of the water jacket furnaces at these works at Denver have been rebuilt, and their size increased from 36 by 80 to 36 by 100 inches. Three other furnaces still remain to be enlarged, which will, however, not be undertaken until their wear necessitates reconstruction. The tenth furnace will not be increased in size, as it is run almost exclusively on slag shells, and for this work the present size is best adapted. The enlarging of the furnaces will increase the capacity of the works to about 400 tons of ore a day. The change is further made on account of the necessity for economical work. In a conversation with Messrs. Grant and James, says the Denver *Mining Industry*, both these gentlemen stated that they had no desire to increase the capacity of the plant beyond the addition that would be gained in this direction by enlarging the remaining furnaces, which would be only about 30 tons a day above the quanity they are now able to handle. Last month the Denver works reduced 11,700 tons of ore, and it is estimated that during the present year 150,000 tons of ore will be reduced. Among the permanent improvements in progress at the works may be noted the rebuilding of a number of the fusing of reverberatory furnaces, erected when the smelter was first built. On account of the refractory nature of the bulk of the ore received, this branch of smelting has become a very important one, and nearly 20 of these furnaces are in use continually, treating matte, flue dust and sulphide ores. Another improvement consists of the addition of 450 feet to the dust chambers, the original chamber being extended from the furnaces and then returned again back to the stack. This will increase the cooling area through which the fumes from the furnace will have to pass, and add to the probable saving by the additional condensation of volatilized lead, and increased collection of silver carried mechanically in fine particles from the furnaces.

CLEAR CREEK COUNTY.

FREELAND.—The production for September amounted to: gold, $8004.95; silver, $1214.71; total, $9219.66.

PLUTUS MINING AND MILLING COMPANY.—A sample of the rich ore encountered in this mine a short time ago was sent to the Boston & Colorado Smelting Company at Argo, for examination, and the following report was made by Richard Pearce, the manager, regarding the ore: "I find that the ore contains copper, 42¼ per cent: silver, 26¼ per cent (or 7673 ounces per ton); iron, 6¼ per cent; sulphur, 19⅓ per cent; lead and other foreign matters, not determined I believe the mineral to be a mixture of bornite and stromeyrite; the bornite being represented by the purple mineral, and the stromeyrite by the steel gray mineral, which appears to be intimately mixed with the bornite." The production for September amounted to: gold, $5510.50; silver, $4782.08; copper, $257.01; total, $10,549.59.

CUSTER COUNTY.

SECURITY MINING AND MILLING COMPANY.—The Wet Mountain *Tribune* says that "the present manager, Mr. Johnson, has had much to contend with since he assumed control. In the first place the mining property was left to him in a shape little less than chaotic. Then the mill, which was set in motion before there was the least necessity for it, had to be partially remodeled, while the ground had to be put in shape for prospecting. While this was going on some person was causing to be published fabulous accounts of the wealth of the mine, thereby creating abroad erroneous ideas of the property and wild expectations as to speedy and big dividends, and now it is not to be wondered that there should be more or less clamoring among small stockholders who were misled as to the condition of affairs. It is said the property will, when fully developed, meet all expectations, and satisfy even the most ardent dividend-howlers, but it won't be this month, nor yet possibly the next twelve months." The stockholders who purchased this stock on the false representations made by Dr. R. C. Flower, of Boston, and other interested parties can, we believe, recover the amounts they paid out.—Ed. ENGINEERING AND MINING JOURNAL.

FREMONT COUNTY.

CAÑON CITY COAL COMPANY.—This company is opening a very extensive colliery at Brookside, a new town 3¼ miles from Cañon City. The coal of this company is to be put into Denver under the name of the Santa Fe Cañon Coal.

The sale in Denver of the coal of this field was made possible by the construction of an independent line—the Denver & Santa Fe Railroad, as this coal could not be shipped over the third-rail line on the Denver & Rio Grande road-bed.

LAKE COUNTY.

ADAMS MINING COMPANY.—At this property every thing looks brighter and more encouraging than for a long time, says the Denver *Mining Industry*. The concentrator is nearing completion, the larger part of the machinery having arrived, and is now being placed and within thirty days it will probably be started up. The discovery shaft near the concentrator has been cleaned out and a good plant of machinery placed there, and the pumps are ready to start, when drifting will be commenced toward the ore-body on the line of the Maid of Erin, which will add largely to the output of the property and assure enough ore to keep the concentrator running steadily. A fine body of ore has been opened on the upper contact of the Brookland shaft running north, where the bulk of the company's ground lies, and which has been undeveloped by themselves, giving a handsome yield to the mine, and it is now shown that when the Maid of Erin shaft, which is being rapidly sunk, reaches a little more depth, they will take such a part of the water as will enable the Adams pump to handle all the water they will have with ease, and take any amount of ore they desire to from the large bodies on the lower levels.

CLEVELAND MINING COMPANY.—This company, on Little Ellen Hill, has closed down its mine, not finding any ore on the development it has been making through the Last Chance shaft. The scheme of sinking a deep shaft on the property is now under consideration, but the prospects of effecting it are not very good.

IRON SILVER MINING COMPANY.—The old dumps that were made when the mine was first opened have almost all been put through the concentrator, and this winter it will work on the low-grade ore still standing in the mine. The ore in the latest workings opened continues high grade and the ore hoisted from the McCuen shaft averages about $100, and the ore taken from the workings connected with the Stevens shaft is even better than that in grade.

ST. KEVIN MINING COMPANY.—The recent strike was in the 150-foot level, and is dipping west. The vein is said to be five feet in width, and has hitherto been missed in this level in consequence of the stringers and smaller chutes having been exclusively followed. A smaller but good streak of ore has also been struck in one of the lower levels.

LEADVILLE CONSOLIDATED MINING COMPANY.—The company has decided to prospect its territory, and for this purpose has purchased hoisting and other machinery, which will be necessary to sink the Hungeman shaft to the proper depth. It is at present down 500 feet, but the management is preparing to sink it to twice that depth should it be necessary. The treasury now holds over $100,000, and it is now proposed to expend every cent of this, if necessary, in development.

OURAY COUNTY.

NEW GUSTON COMPANY, LIMITED.—This company, to which we referred in our issue of the 18th inst., appears to be a reorganization of the Guston Company, and local papers state that it should be noted that suit is now pending in the courts by which D. C. Hartwell and W. Weston, the owners of some 8000 shares in the old company, seek to have a receiver appointed for the mine and to restrain the directors from confiscating their shares because they refused to come into the new company. This they did on the grounds of gross mismanagement and willful squandering of the company's working capital by the London management and their present agent at Ouray.

PITKIN COUNTY.

A meeting was held at Colorado Springs on the 17th inst., referred to in our last issue, by the parties interested in the compromise of the Apex and Side-lines controversy at Aspen, and the result has been that two mining companies have been organized with a capital stock of $1,000,000; shares, $10 each. One of these companies has been named the Compromise and the other the Enterprise. The Compromise Company will operate in the territory included within the side-lines of the Durant mine extended, which will embrace part of the Emma, Little Giant, Vallejo, Aspen, Aspen Mammoth, Forest, Hercules and other claims. The territory of the Enterprise is all that portion of ground which lies on the slope of the hill on which is located the Thousand and One, Chance, Betsy Jane, Banner, Hidden Treasure, Enterprise, Enterprise Tunnel and other claims. It is stated that Messrs. Butler and Brown, who own two-thirds of the Aspen mine, have as yet failed to give their consent to the agreement. Both companies have already begun work.

DAKOTA.

The coal from the Hay Creek coal-fields, to which we referred in our issue of September 10th, is finding a good market in Deadwood and the vicinity.

LAWRENCE COUNTY.

ELK MOUNTAIN CARBONATE MINING COMPANY.—This company has been organized to work Blackfoot, Modoc and Red Cloud claims, all of which present good prospects.

GALENA SMELTING AND REDUCTION COMPANY.—The smelter started up last week.

IRON HILL MINING COMPANY.—A slide of rock is reported to have occurred on the 23d inst. on the 160 level, bringing down ore of the estimated value of $100,000.

TERRY'S PEAK MINING COMPANY.—This company has been organized, with a capital stock of $500,000, shares $5 each, and succeeds to all rights and titles of the old Welcome Company, the property consisting of eight claims, including the Empress and Empress fraction, two water rights, two mill sights and two mills (Welcome and Snow Storm), all located in Fantail Gulch and vicinity. Twenty thousand shares of stock are set aside for a working capital, and thorough systematic operations will shortly be inaugurated. The old Welcome mill is equipped with rolls and all modern appliances; and the Snow Storm has twenty stamps, which, as well as all machinery, are practically new. The officers are: Charles Waite, President Russell, of New York, Vice-President; A. J. Malterner, Secretary; W. H. Norris, Assistant Secretary and General Manager; A. J. Malterner, Superintendent.

PENNINGTON COUNTY.

HERMOSA HYDRAULIC COMPANY.—This company, which has a capital stock of $1,000,000, par value of shares $2 each, organized under the laws of Dakota, is a reorganization of the Battle Creek Gravel Mining Company, to the sale of which to Geo. W. Chadwick we referred in our issue of May 21st. The officers of the new company are: Louis Flohrman, President; F. L. Chadwick, Treasurer; Chas. W. Bryden, Secretary, and these with the Hon. Geo. W. Wood, Wm. Buck and J. M. Littell form the board of directors. The company owns the claims known as the Mamaluke Hill, Gold Point, Phillips Hill, Boswell Hill and others, several gulch placer claims, flumes, monitors which work under 190 feet head, water rights, etc. In our issue of June 11th, we stated that Mr. Chadwick sold this property to Cincinnati capitalists, who would push work on the property. The property is said to have had expended on it already about $250,000, and is now under lease for $80,000 a year. The company is to pay its first dividend of 1 cent a share, on November 5th.

IDAHO.

ALTURAS COUNTY.

CAMAS NO. 2.—In our issue of August 13th, we announced the sale of this mine. We have just learnt that the sale was made to Mr. A. D. Churchill, M.E., of New York, and Mr. John Chase, of Hailey, who purchased the mine and mill for the sum of $2,000,000, with the stipulation that $250,000 was to be paid in 90 days. We hear that they actually got possession of the property, and have been working it in a small way for about three months, and just about paying expenses, but great doubts are entertained as to their ability to perform that part of the contract which entails the payment of the first installment.

IOWA.

POLK COUNTY.

GARVER.—The top shaft of this coal mine was destroyed by fire on the 26th inst., the fire cleared up all the buildings and did much damage to the large boiler and engines. The shaft burned to a depth of twenty feet. The loss is roughly estimated at $20,000.

KANSAS.

Reports state that a leading salt manufacturer from the East has purchased land in the vicinity of South Hutchinson, where a strike of salt was recently made, as mentioned in our issue of the 15th inst., for the mining and manufacturing of salt. Later reports state that crude petroleum has been struck at a depth of 620 feet, 36 feet below the salt vein.

MEXICO.

A St. Louis syndicate has purchased the property known as the La Union, which consists of the San Rafael, El Cedro, and the Purrissima, on Veta Madre vein, at Guanajuato. The officers of this syndicate are: L. B. Stephenson, of Selbyville, Ill., President; T. A. Patterson, of Chicago, Vice-President; Western Bascombe, Treasurer; W. B. Coomes, Secretary, and and S. W. Kearney, Superintendent at the mine. The mine is now being unwatered, when operations will begin.

ST. LOUIS & MEXICAN INVESTMENT AND IMPROVEMENT COMPANY.—At a meeting of this company, held at St. Louis on the 22d, it was decided to accept the offer of the financial agent of the company at Zacatecas, Mr. Juan A. Petite, a prominent banker there, to subscribe for the balance of the bonds, $20,000. It is said that this company, to the difficulties of which we reported in our issue of the 15th inst., and previous to that, is now in good shape, having all its buildings and machinery paid for, and also $25,000 worth of supplies. The $20,000 to be received from Mr. Petite for the bonds just purchased will be devoted entirely to the payment of labor. The mine has been unwatered and active operations began.

MICHIGAN.

It is announced that the Michigan Salt Association, which controls the market west of Cleveland to the Rocky Mountains, will stop the manufacture of salt from December 1st to April 1st to reduce the large surplus now on the market.

Press dispatches announce that natural gas was struck a short distance from Southfield, Oakland County, at a depth of 112 feet.

MICHIGAN & OHIO COAL AND LUMBER COMPANY.—This company, which has a capital of $50,000, and whose yards and mills are located at Tecumseh, has assigned. Liabilities about $20,000; assets the same.

COPPER MINES.

ATLANTIC MINING COMPANY.—No. 1 shaft, which was started up this fall after lying idle for a number of years, is producing good rock. From this shaft they are hoisting about sixty skip loads each shift of ten hours. More drills are to be started in this shaft, and the number of skips hoisted per day increased.

KEARSARGE COPPER MINING COMPANY.—The crosscut in the fifth level, No. 2 shaft of this mine, it is said shows a 10-foot lode of good looking ore, and found to average 2 per cent mineral. The mine is as yet only worked for development.

ST. CLAIR LIGHT AND FUEL COMPANY.—This company expects to furnish Port Huron with natural gas by the end of November.

IRON MINES.

AURORA MINING COMPANY.—According to reports, Messrs. Moore, Benjamin & Co. are negotiating to sell their controlling interest in this company to Walter Potter, Evans, and other Boston parties. The price under consideration being $1,200,000 or $12 per share. The company has 100,000 shares.

EAST NEW YORK.—Recent explorations on this property show good results. The drift from the old shaft is over 20 feet in ore, and still continues in it. In quality the ore is first-class, and a Bessemer. The first cargo of ore has been sent from this mine to the Deer Lake furnace. Ore will also be shipped to Cleveland.

KIMBALL.—This mine, near Crystal Falls, is again in the possession of Dr. H. C. Kimball. He sold it last winter to Milwaukee parties, who organized the Kimball Iron Mining Company, with a capital stock of $1,000,000. By the terms of the sale Dr. Kimball was to receive $10,000 in cash and 10,000 shares, or one-fourth of the capital stock. The company, in order to raise the purchase money and obtain a fund for developing the property, sold the treasury stock, but the money realized in this manner was insufficient, and the stockholders were called upon to contribute funds with which to continue work. They refused, and finally the company gave Dr. Kimball a mortgage for $6,000, running thirty days. When the mortgage ran out, it was foreclosed, and Dr. Kimball has just bought the property at the foreclosure sale.

MINNESOTA.

According to press dispatches a sale is now pending and virtually closed of a half interest in valuable iron lands on Vermillion Range, near Duluth, owned by the Consolidated Vermillion Company to English capitalists for $3,000,000. The land comprises 2392 acres of iron properties, some of which has already been partially developed. The new purchasers are negotiating for other properties on the iron range. The deal is one of the most important, it is said, ever made on the Vermillion range.

COOK COUNTY.

The discovery is reported of gold and silver ores about forty miles north of Grand Marais, and in a range of townships five or six miles south of the international boundary line. About thirty miles inland from Grand Marris are so-called ancient diggings of rich silver mines, worked, as is supposed, by ancient Toltecs. These gold discoveries are about a dozen miles northeast of this location.

MONTANA.

DEER LODGE COUNTY.

GRANITE MOUNTAIN MINING COMPANY.—It is stated that the company will double its milling capacity and increase the monthly dividend. The 100 stamps now run at Granite produce an average of over 60,000 ounces of silver each week. This is also by picking the ore, taking only sufficient high-grade ore and mixing with low-grade in such proportion as to average 150 ounces per ton. While this is done, it is not to save the high grade ore, but to use up the lower grade, and so be able to keep the output steady and unvarying.

SILVER BOW COUNTY.

General Manager Potter, of the Union Pacific Railroad Company, has informed President Clark, of the Butte Board of Trade, that from November 1st, the freight rate on salt from Utah points to Butte will be $9 per ton. Add to this the cost of salt, about $3 per ton, and it will make the cost laid down $12, which is a reduction of $3. It is not probable the reduction will be considered sufficient to justify the Alice mill in starting up, but it will make a considerable difference to the mills which would continue operations any way. It also gives the mills an opportunity to buy salt for themselves, in which manner they can probably make an additional saving.

POLLOCK.—The work done at this mine, in which St. Louis parties are interested, is showing good results, and it is stated that the erection in the spring of a 40-stamp mill is contemplated.

NEVADA.

ELKO COUNTY.

SEAL OF NEVADA MINING COMPANY.—This company, to the organization of which we referred in our issue of the 15th inst., will work a mine originally known as the Van Vleck claim, located at the forks of Eureka Gulch, southwest of Tuscarora and south of the Navajo, North Belle Isle and Nevada Queen mines. The compartment prospecting shaft at a depth of 16 feet developed vein matter rich in gold and silver.

HUMBOLDT COUNTY.

PARADISE VALLEY MINING COMPANY.—The annual report shows that out of a total bullion product of $279,893.74 for the past year the net production of the mine was $215,565.27, the difference, $64,328.47, being lost through the heavy discount on silver. Dividends aggregating $40,000 were paid to stockholders. The superintendent states that the permanent prospects of the mine are more encouraging than at any previous time in its history.

NYE COUNTY.

ROCKY GLEN.—Messrs. Hayward and W. S. Hobart have bought this mine, near Grantsville, for $22.500. For nearly a year the purchasers have been prospecting the mine under a bond. They have erected new hoisting and pumping machinery on the mine, and next summer will build a mill. The mine is being opened through a tunnel 200 feet below the surface, and there is a shaft now 100 feet below the floor of the tunnel. The ore averages about $10 per ton in gold

NEW BRUNSWICK.

Mr. McInnis, of the geological survey staff, has just returned to Ottawa from the northern part of New Brunswick, where he has spent the summer exploring. He is reported to have said that the country is devoid of valuable minerals, but in other respects is one of the finest he has ever seen.

NEW MEXICO.

BROMIDE MINING COMPANY.—This company, recently organized, has purchased a claim near Pres Piedras, and will at once commence work, and make preparations for mining on a large scale. A hoisting and pumping plant, adapted to a shaft 500 feet in depth, has been purchased from Messrs. Fraser & Chalmers, of Chicago.

SOCORRO COUNTY.

PAULINE MINING COMPANY.—All parties holding claims against this company are requested to present the same at the office of Conway, Posey & Hawkins, Silver City. The money is now ready to pay all bills. It is not yet known if work will be resumed.

OHIO.

Lima was lighted with natural gas for the first time on the 21st inst. It is the enterprise of the Standard Oil Company. This gas is piped twenty-six miles from Lima, from St. Mary's O., and the ditching, laying the mains, etc, cost $200,000. Gas will be furnished to manufacturers at 70 per cent of their last year's fuel bill.

The stand-pipe on the public square at Lima is 15 feet high, and the pressure is so strong that it is fully two feet from the end of the pipe to the blaze, and the blaze is about 20 feet high. This gas is all from one well.

PENNSYLVANIA.

At the iron ore mines of Oliver M. Brensinger, in Long Swamp township, the sheriff, on the 26th inst., levied upon the machinery and ore on hand, upon an execution for $1547.40 issued at the suit of John K. Howden, of Reading, in trust.

COAL.

TUNNEL RIDGE.—This colliery in the Mahanoy District has resumed work after several years suspension. In a short time it is expected to run the shipments up to their old standard.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to October 22d:

	1887. Gallons.	1886. Gallons.
From Boston	3,336,127	4,546,632
Philadelphia	132,959,364	122,744,959
Baltimore	6,502,266	12,986,707
Perth Amboy	13,235,629	4,850,046
New York	305,998,015	316,994,892
Total exports	462,031,401	462,123,236

The company of Norwich capitalists boring for natural gas and petroleum in the upper Chenango Valley has a well down in a ravine south of that town about 700 feet. On the 26th inst. the drill struck a vein of gas that flowed from the mouth of the well with great force and volume. The company will thoroughly explore the territory.

EAST PENNSYLVANIA OIL AND GAS COMPANY.—This company, of Meadville, has leased several thousand acres of lands in the lower Chenango Valley, and is now setting up a derrick for boring a well on the farm of Sheriff Brown, eight miles north of Binghamton.

UTAH.

UTAH ORE PRODUCERS' ASSOCIATION.—This association has been formed in Salt Lake City by parties interested in the mining industry of Utah. The officers are: President, W. F. James; Vice-President, J. E. Dooly; Secretary, W. G. Van Horne; Treasurer, W. F. Colton. The Executive Committee is composed of C. E. Mitchener, W. F. James, J. E. Dooly, L. U. Colbath, A. Neidringhaus, Harry Duke, J. Q. Packard, Hank Smith, B. B. Van Dusen, M. M. Kaighn, and W. G. Van Horne. The object of the association is the better protection of ore producers and the advancement of the mining interests of Utah. In pursuance of this the members pledge themselves:

1. To stand together and support our mutual interests.

2. To stand by and patronize such reduction-works as will meet us on fair terms, half way, in adjusting the differences now existing between the miner and the smelter, so we may obtain a fair share of the profits of our ores.

3. We pledge our support to independent samplers and assayers.

4. We pledge ourselves to patronize the railroad that gives the fairest rate on our ores and bullion, and which adjusts its rates in a way to place us upon an equality—the location being considered—with the miners and smelters of other territories and States.

5. To use our best endeavors, in conjunction with the people of other mining territories and States, to ward off the legislation which threatens to place lead ores on the free list, and in the same connection to use our best endeavors to protect and defend the interest of silver; to extend the coinage to the maximum allowed by law, and to repeal the alien land law so far as it affects the mining interests.

6. We pledge ourselves by all reasonable means to spread before the country a knowledge of the measureless mineral resources of this region and to try to make clear the advantages which this region offers for the investment of capital.

7. In case no fair arrangement shall be made with existing smelters, we pledge ourselves to co-operate with any citizen or firm that will immediately undertake to erect, convenient to this point, perfect and extensive reduction and refining works for the treatment of the multiplied minerals of this region and agree to reduce ores at a reasonable price.

8. The executive committee shall make terms with smelters and railroads; shall gather information regarding the territory and the business of mining; shall, in short, be the working force of the association, but shall not bind the association in any important contract without the approval of the majority of the members of the association.

9. The association may at any meeting, by a majority vote, change or add to these articles.

The smelting men say this association can not have much practical effect on the price of ores, as they were before paying every cent that ores were worth, and were not making any money; but the ore men say there is already a marked effect, and that better prices are offered.

BEAVER AND MILLARD COUNTIES.

DICKERT & MYERS SULPHUR COMPANY.—It is reported that Mr. F. Dickert, the manager, was successful on his recent trip to Omaha, St. Louis and Chicago, to which we referred in our issue of the 15th inst., in inducing the roads to so reduce freights as to enable him to successfully compete with the seaboard refiners at St. Paul, Chicago, St. Louis, New Orleans and other commercial centers in the Middle and Western States.

JUAB COUNTY.

TREASURE MINING COMPANY.—This company has been organized at Salt Lake City, where the principal office will be, with a capital stock of $160,000, shares $10 each. The officers are: President, Thomas Marshall; Vice-President, Harry T. Duke; Secretary and Treasurer, John E. Dooly. The company owns the Golden Treasure mine, situated in Tintic mining district, Juab County, together with all buildings and improvements.

WASHINGTON COUNTY.

STORMONT MINING COMPANY.—We are officially advised that Messrs. Wolley, Lund & Judd, of Silver Reef, have leased the Stormont Mill, at that place. This firm is the most important firm in Southern Utah. Thos. P. Gillespie, late manager of the mill for the Stormont Company, will remain in charge of the mill for the lesees.

VIRGINIA.

ALLEGHANY COUNTY.

Our correspondent advises us that the washer at the Stack mines has been stopped for the winter, a large amount of wash and lump ore being stocked for future delivery.

BEDFORD COUNTY.

We are officially advised that a company is negotiating with Mr. A. M. Doyle, of Bellevue, to open the celebrated mica mines at that place.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Oct. 28.

Statistics.

Production Anthracite Coal for week ended October 22d, and year from January 1st:

Tons of 2240 lbs.	1887. Week.	1887. Year.	1886. Year
P. & Read. RR. Co.	169,606	5,873,777	9,270,358
Cent. R. R. of N. J.	90,395	3,913,016	*
L. V. RR. Co.	118,296	5,053,913	5,001,533
D., L. & W. RR. Co.	167,205	4,548,343	4,034,640
D. & H. Canal Co.	91,801	3,061,042	2,928,933
Penna. RR.	47,481	2,892,157	2,489,687
Penna. Coal Co.	36,281	1,217,212	1,109,652
Penna. Canal Co.	19,567	394,948	397,876
Total	740,632	26,954,408	25,232,679
Increase		1,721,729	
Decrease	45,500		

* Included in tonnage of Philadelphia & Reading RR.

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1882	23,761,446	1884	25,089,200
1883	25,936,102	1885	24,402,571

Production Bituminous Coal for week ended October 22d, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1887. Week.	1887. Year.	1886. Year.
Phila. & Erie RR.	486	17,356	7,984
Cumberland, Md.	80,814	2,569,140	1,967,267
Barclay, Pa.	2,839	147,056	151,669
Broad Top, Pa.			
H. & Broad Top. RR.	11,634	269,216	305,918
Clearfield Region, Pa.			
Snow Shoe	3,244	131,039	85,626
Karthaus (Keating).	7,632	150,447	111,524
Tyrone & Clearfield.	66,124	2,541,361	1,722,556
Tipton	181	13,241	.....
Alleghany Region, Pa.			
Gallitzin & Mountain.	18,280	762,776	548,003
Pocahontas Flat Top Coal.			
Norf'k & West. RR.	25,512	905,227	688,389
Kanawha Region, W. Va.			
Ches. & Ohio RR.	†35,000	1,143,499	995,719
Total	251,746	8,650,358	6,584,655

* Tons of 2240 lbs.

† Estimated.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.			
West Penn RR.....	4,675	241,074	260,396
Southwest Penn. RR..	2,457	92.023	133,596
Pennsylvania RR....	2,946	165,987	222,812
Westmoreland Region, Pa.			
Pennsylvania RR.....	28,031	1,252,592	975,986
Monongahela Region, Pa.			
Pennsylvania RR.....	10.992	339,842	319,870
Total.....	49,101	2,091,518	1,912,660
Grand total.....	300,847	10,741,876	8,256,671

Production of Coke on line of Pennsylvania RR. for week ended October 22d, and year from January 1st. Tons of 2000 pounds.

	1887. Week.	1887. Year.	1886. Year.
Tyrone & Clearfield ..	15	1,750	....
Allegheny Region ...	5.157	201,542	151,024
West Penn. RR.....	1,800	89.741	86,282
Southwest Penn.RR .	64,122	1,249,537	2,125,951
Penn. & W. Region..	10,555	277,438	263,949
Monongahela..	2 059	98,932	113,140
Pittsburg Region....	....	38	15
Snow-Shoe..... ...	1,415	42,554	21,573
Total.....	85.123	1,961,532	2,761,934

Anthracite.

Anthracite continues very scarce, and for spot or early delivery fancy prices are obtained. We hear of $5.50 being obtained for Lehigh egg and lump, and $5 f.o.b. for other sizes. It is rare, indeed, that egg coal sells above stove; but when coal is scarce the scarcest size brings the most money. Free burning coals are quoted as a week ago. F.o.b. New York shipping ports may be quoted as: Grate, $3.80; Egg, $4.10; Stove, $4.35@$4.50; Nut, $4.25@$4.40; Pea, $3.

The strike in the Lehigh appears rather less likely to be settled promptly than it did two weeks ago. The Knights of Labor have been sending provisions and money to the district, and this has braced up the men. Nevertheless, some men, and increasing numbers of them, are at work, both in some of Coxe Brothers' and Pardu's mines. The operators are immovable in their determination not to allow any outside organization to interfere in their business, and the collapse of the strike must come by the concession of the men on this point. Unfortunately much suffering and loss will come to them from this strike for an unreasonable and unjust demand. How much better for them to be profiting by the present high prices of coal to get high wages, as they would under the sliding scale.

The reports from Lake ports, from interior towns, and in fact from all quarters are practically the same, "the question is not one of price, but of getting the coal," and yet our production of anthracite this year will be nearly 2¼ million tons greater than last year.

Bituminous.

This market is very strong, and the regulation price, $3.50 per ton, is easily obtained for all good calls.

Scarcity of cars is the constant cry of both the Clearfield and Cumberland mines, which are so far behind their contracts in deliveries that there is no prospect of their "catching up" this season.

It is true, as we recently stated, that the production of bituminous coal in the east is for this year about 35 per cent. greater than in the corresponding months of last year.

The railroads are quite insufficiently supplied with cars to do the enormous business demanded of them in every part of the country, and this bears heavily on the coal trade.

The Pocahontas coal continues to come to this market, fully 8000 tons having been sent here already. It finds a ready sale at $3.50, and is being used with great satisfaction as a steam fuel.

Boston. Oct. 27.

[From our Special Correspondent.]

Where all the anthracite coal goes to and has gone to is a query which the Bostonians must answer by saying that "this is a big country." No unusual amount has come East, but it certainly has gone somewhere, for the scarcity is about as great as ever. It is said that the output is being forced, but no visible results appear of any unusual production, unless it be in the increased amount of poor coal on the market. There is not as much of this stuff as is wanted, for coal which would scarcely sell at any price last summer is "going like hot cakes." The companies have so little coal to offer in this market that trade is forced to be inactive. Boston retail yards are very busy, and it is doubtful if some dealers know just where they are in regard to coal supply, because of unfilled orders. Railroad points and places above tide-water are fairly well supplied. As long as the Lehigh strike still continues none of that coal can be had in this market, and the agent of the Philadelphia & Reading here is unable to take any orders for any kind of coal. The general expectation is that the increased output will shortly bring about a more comfortable state of affairs. New York f.o.b. quotations remain very firm. Even pea coal is in light stock now, and we hear of $2.50 f.o.b. being refused and $2.75@$3 asked.

As long as cars remain as scarce as they now are, bituminous coal will be well sustained in price. We quote as before, $2.50@$2.60 f.o.b. The coal gas business is about over, contracts having been made generally at $1.80@$1.90 f.o.b. or $4,15@$4.25 alongside.

Vessels appear to be more plenty at Baltimore, and a reduction of five cents is reported at that point. We quote rates, exclusive of discharging: New York, 75@85c.; Philadelphia, 95c.@$1.05; Baltimore, $1.15@$1.25; Newport News and Norfolk, $1@$1.15.

As above stated retail trade is first rate. Orders are numerous and apparently larger than usual. Advanced prices are readily maintained. Delivered prices are: Stove, $6.25; Egg, $6; Furnace, $5.75; Nut, $6.25; Franklin, $7.50; Lehigh Egg, $6.25; Furnace, $6. Wharf prices are 50 cents less than the foregoing.

Buffalo. Oct. 27.

[From our Special Correspondent.]

The trade in hard and soft coal, also coke is without any new features. The salient points described during the past few weeks continue in full force and vigor, and if possible, stronger. The talk is still of strikes, lack of cars, near close of the navigation season, natural gas and other cognate items.

Our Business Men's Association has been investigating the matter of the cost of gas in prominent cities, and find that with but few exceptions Buffalo is heavily taxed for this commodity. Twenty-one places out of twenty-seven heard from had better rates than Buffalo. These rates are noteworthy as illustrations: Buffalo, per 1000 feet, $1.40, Cleveland $1, and Pittsburg 75c. This city also pays 50 per cent more for electric lights than the average of New York City, Syracuse, Poughkeepsie, Watertown, Joliet (Ill.), Newburg (N. J.), Jackson (Mich.), and Sandusky (O.), and yet Buffalo has cheaper or as cheap fuel, which is the principal element in the manufacture of electric as well as gas light, as any of those large or small cities.

The severe storm of Sunday and Monday was productive of numerous disasters on the lakes. The wind here early Monday morning ranged for several hours from 60 to 66 miles per hour. The newspapers are full of stirring reports of accidents, losses of life and vessels. The lake freighting business was interrupted to a considerable extent, as a large fleet of vessels was detained here, and the arrivals were light. Captains describe the seas as being terrible, and at times heavy snow fell. Many coal laden vessels have sank, several in such deep water that there is no chance of their recovery; probably 8000 tons of fuel are out of sight.

Lake freights dull and unchanged. The going rates for the week were as follows: $1 to Chicago and Milwaukee, 50c. to Toledo, Sandusky, Cleveland, and Detroit; 75c. to Superior, Marine City, and Saginaw; on contract, 50c. to Duluth, 90c. to Port Huron $1 to Green Bay, $1.25 to Portage and Marquette, and 50c. to Bay City, closing quiet; supply of coal light; vessels awaiting cargoes.

The shipments of coal westward by lake from October 20th to 26th, both days inclusive, aggregated only 33,330 net tons, namely, 17,980 to Chicago, 4350 to Milwaukee, 1000 to Duluth, 2470 to Toledo, 400 to Bay City, 1100 to Green Bay, 600 to Saginaw, 430 to Marine City, 1250 to Port Huron, 2050 to Marquette, 450 to Cleveland, 700 to Portage, and 550 to Sandusky. Total for the season, not including vessels from Tonawanda, 1,458,967 net tons.

Receipts of coal by canal for third week in October only 989 net tons, and shipments 185 net tons.

The canal charter for coal for past week was: 1 load to Lockport, at 35c. net ton, free on and off. Nominally $1 to Albany, and $1.40 to New York (captain to pay loading and unloading) per net ton.

A dispatch from Washington, dated October 21st, says: "A complaint was received to-day by the Inter-State Commission from the Allegheny Coal Producers' Association of Renier, Pa., against the Allegheny Valley Railroad Company, in which it is alleged that the railroad company has increased the rate on coal to Buffalo from 85 cents to $1.10 per ton, with the result of stopping shipments by the members of the association, while rates from other points equally distant from Buffalo are kept at the lowest named figure."

Chicago.

Press dispatches from Chicago, dated to-day, say: Winter weather has already set in, and there is considerable suffering among the poor. In August small egg coal sold for $6.75. In September it was advanced to $7. On October 1st to $7.25, and on October 14th to $7.75. This is the figure for purchasers who can afford to take at least a ton at a time, while the unfortunates who depend on a hand-to-mouth supply and get what they need by the basketful from peddlers, are taxed somewhere in the neighborhood of $15. The public may expect coal to reach $10 a ton by New Year's day.

Pittsburg. Oct. 27.

[From our Special Correspondent.]

Coal.—The market is firm but no higher here. At Cincinnati prices have advanced; 2d pool, 11¼; and 4th pool, 10c.

The miners on the Monongahela are demanding ¼ cent advance. The coal men say that an advance at this time is out of the question. No shipments by water since June is calculated to make consumers feel uneasy in the lower markets. Price of coal f.o.b., first pool, $4.50; second pool, $4.25; third pool, $3.65; fourth pool, $3. Coke at ovens, per ton: Blast-furnace, $2; Crushed, $2.60; Foundry, $2.60.

Coke.—The cry is still for more cars. Prices have undergone no changes. The demand was active. A new coke company was chartered at Harrisburg on Wednesday with a capital of $100,000. Others are talked of.

FREIGHTS.

The latest actual charters to Oct. 27th, per ton of 2240 pounds:

From Philadelphia to:—Alexandria, 85; Baltimore, 60§; Bangor, 1.15; Boston, 95@1.05*; Cambridge, Mass., 1.15; Charleston, 75; Com. Pt., 1.00@1.05*; E. Boston, 95@1.05*; E. Cambridge, 95@1.05*; Galveston, 2 45; Gardner, Me, 1.05@1.10*; Georgetown, 85; Gloucester, 1.05*; Lynn, 1.05@1.25; Newark, 90§; New Bedford, 90@1.00*; Newburyport, 1.10*; New York, 90§; Norfolk, Va., 60; Pawtucket, 1.10*; Portland, 95@1.05; Portsmouth, N. H., 95@1.10*; Richmond, Va., 75; Salem, 95@1.05*; Savannah, 90@1.00; Troy, 1.10§; Washington, 85.

From New York to:—Bangor, 85*; Bath, Me., 90*; Beverly, 85*; Boston, 85*; Bridgeport, 75; Bristol, 85; Cambridge, Mass., 80*3c.; Cambridgeport, 80*3c.; Chelsea, 85*; Com. Pt., Mass., 85*; E. Boston, 85*; E. Cambridge, 85*3c.; E. Greenwich, 85@90; New Bedford, 90; Newburyport, 1.00*; New Haven, 75; New London, 80; Newport, 85; Norwalk, Conn., 75; Portsmouth, N. H., 95*; Providence, 85; Salem, 85*.

From Baltimore to:—Bangor, 1.25; Bath, 1.25; Boston, 1 25; Bridgeport, 1.15; Bristol, 1.15; Brooklyn, 1.00; Charleston, 80@90; Fall River, 1.15; Galveston, 2.75; Lynn, 1.40; New Bedford, 1.15; Newburyport, 1.40; New Haven, 1.15; New London, 1.15; New York, 1.00; Portland, 1.25; Portsmouth, N. H., 1.35; Salem, 1.25; Savannah, 1.10; Williamsburg, N. Y., 1.00; Wilmington, 1.00. Freights firm and tonnage in demand.

* And discharging. † And discharging and towing. 3c. per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing. †† Pilotage. ** Below bridge. *** Old B. L.

MARKETS.

NEW YORK, Friday Evening, Oct. 28.

Prices of Silver per ounce troy.

Oct.	Sterling exchange	Lond'n Pence.	N. Y. Cents	Oct.	Sterling exchange	Lond'n Pence.	N. Y. Cents
22	4.85	44 1-16	95½	26	4.85	†	95⅜
24	4 85	43⅞	95⅛	27	4.85	†	95⅛
25	4.85	*	95¼	28	4.85	44	95⅛

* 43 13-16. † 43 15-16.

At the lower price considerable inquiry for silver has sprung up for the English market.

Melting Trade Dollars.—The last 300,000 of the silver trade dollars recently redeemed by the Government are being melted up at the Assay Office in this city. The amount received by the Sub-Treasury and turned over to the Assay Office for melting into bullion aggregates $3,500,000. As the old dollars are melted up they are cast into bars and placed in one of the vaults of the office.

Foreign Bank Statements.—The governors of the Bank of England at their weekly meeting made no change in its rate for discount, and it remains at 4 per cent. During the week, the bank gained £40,000 bullion, and the proportion of its reserve to its liabilities was raised from 43·87 to 45·47 per cent, against a gain from 40 to 41·50 per cent in the same week of last year. The weekly statement of the Bank of France shows a loss of 4,475,000 francs gold and a loss of 1,275,000 francs silver.

Storage of Silver Dollars at Washington.—Last spring the Treasury Department began the construction of a huge vault for the storage of silver dollars, which will be completed early in November, and will hold by careful storage 105,000,000 silver dollars Large as this sum is, it is stated at the Treasury that there is nearly enough silver now seeking storage to fill up the new vault. It is in the court between the four walls of the Treasury building. It is 89 feet long, 51 feet wide, about 15 feet deep, and rises a few feet only above ground. The outside walls and the floor are made of concrete. It has air chambers all about, and an arched roof covered with brick. Of course there are no windows or other means of obtaining light, and the air chambers are depended on to keep the place dry. There is only one entrance to the vault, this being a small door in the southeast corner. There are nine compartments, separated by iron lattice work partitions, riveted together with thousands of iron bolts. Between the compartments are arranged straight narrow aisles, with small doors opening into the different sections. The necessary gas light will be stationed in these aisles. When the silver dollars are in the vault the pressure is all upon the floor, as the bags are so piled as not to lean against the partitions. The greatest skill is required in piling the bags, as the least unevenness might result in upsetting the whole pile, and perhaps causing them to fall outward upon the visitors or employés. The cost of the vault will be about $30,000. It was first thought advisable to have the walls double lined with steel. This would have increased the expense to more than $100,000, so it was decided to use walls of concrete.

Copper.—After a long period of inanimation in the metal markets the tide appears at last to have taken a decided turn, and following the lead of tin, copper has now become exceedingly active in London, and our markets here have, of course, responded to this change of feeling, and prices have consequently advanced with considerable rapidity. It was certainly rather strange that in face of the very favorable condition of the copper stocks from a statistical point of view prices shou'd have remained so low for such a considerable period, but a good many influences were also tending to defer any marked upward movement. The unfavorable conditions appear now to have been removed. According to Messrs. Henry R. Mertin & Co.'s statistics the following were the stocks of copper and prices of Chili bars, viz.:

	Visible supply. Tons.	Price of Chili bars. £ s. d.
September 30th, 1887.....	49,176	38 15 0
1886	64,826	41 2 6
1885.....	58.065	40 15 0
1884.....	41,723	54 2 6

In order to compare the present with the time when the stocks were about the same quantity, we have to go back to December 31st, 1884, when the visible stocks were 49,543 tons and the price of Chili bars

£47 5s. In addition to this, it is an undisputable fact that for more than a year past the supplies have proved to be considerably less than the consumption, so that it can not be considered that the rise which has taken place, although somewhat rapid, is in any sense unwarranted, and in many quarters it is thought quite likely that present prices will soon be superseded by still higher quotations. From the point of view of the trade in general the rise in prices is very welcome, as it has for a long time been known that most producers have hardly been able to exist at the prices lately ruling. From these producers, of course, we exclude the large lake companies, who, even with prices at the very lowest, have always been able to pay handsome dividends to their shareholders.

The transactions which have taken place during the week at the Metal Exchange may be estimated at between four and five million of pounds, and jobbers have doubtless done a good business. Sales commenced on Monday at 10⅝ for cash, and prices advanced rapidly and uninterruptedly to 11¼ for cash, with the following closing quotations for forward delivery: December, 11·35; January, 11·45; February, 11·55; March, 11·65.

The lake companies sold several lots of their copper, but the total quantity was comparatively small. Up to the present time the Calumet & Hecla Co. has altogether abstained from making any sales, and even the present prices do not appear to tempt them. Outside copper, which for some time past has commanded a relatively higher price, has not advanced so rapidly as Lake copper during the week, and we have now to quote same 10¼@10⅜c., according to brand. Chili Bars were quoted last Monday in London, £40 for spot, but have now sprung up to £43 15s. for spot, and £44 7s. 6d. for three months forward, with very large transactions. Other kinds of copper are somewhat irregular in price, as is only to be expected after such important fluctuations, but on the whole the position appears to be very strong at the close.

The exports of copper during the last two weeks have been as follows:

To Havre—			
S.S La Bougogne..	45 bbls copper	56,250 lbs.	$5,625
To Liverpool—			
S.S. Plata...	4325 sks. matte	482,240 lbs.	25.000
" Arizona	1680 "	195 450 lbs.	10.000
" Pennsylvania...	213 bbs "	160,000 lbs.	9,000
" " ...	1530 sks. matte	179 660 lbs.	9,000
" Celtic	2654 "	303.540 lbs.	15.500
" City of Rome...	2395 "	280,260 lbs.	15,000
" Arabic	3343 "	375.750 lbs.	18,000
" City of Chicago.	7936 "	889,178 lbs.	45,000
" Germanic.....	4196 "	444,426 lbs.	22,500

Tin has continued very strong during the whole of the week and the bulls still have their own way in the market, so that in London values have still further advanced, and according to cable advices closed at £119 10s.@£120. The margin for futures has widened and several hundred tons weresold for £110@£112, three months prompt. Our market has shown great activity, and under covering of bear sales about 500 tons were sold up to 25¾@26c. for spot, 25¾c. for November, and 24¾@25⅛ for December.

Lead.—This market has been very quiet all the week, with sellers at 4·30 and 4·25, but no anxiety to press sales, while buyers took up some three hundred tons common for November, but are unwilline to lay in large stocks, being somewhat timid as to the future. At the close 4·20 is bid and 4·25 is asked.

Messrs. Everett & Post, of Chicago, telegraph to-day as follows:

The market has ruled dull, and since our last report business has been quiet and of a limited character, with quotations at 4·10c. to 4·15c.; futures, 4·10. Scarcely any thing offered. Most holders, anticipating better prices, have withdrawn from the market at present and refuse to make sales for future delivery at present prices.

Messrs. John Wahl & Co., of St. Louis, telegraph to-day as follows:

There is nothing new to report. Business continues very dull, with but little prospect of any immediate improvement. We may quote both hard and soft lead worth 4c., and in the neighborhood of 500 tons changed hands at these figures.

Spelter is firm. Domestic, 4⅝c. Foreign, 5·10c. to 5·20c. Prices have again advanced in the London market, and are now £15 15s. for ordinaries and £16 for specials.

Sheet Zinc is 6⅛@6¾c.

Antimony.—No change can be reported. Prices continues firm, with quotations for Hallet's, 8·80@8⅛c.; Cookson's, 9¼@9⅜c.

Domestic Antimony is offered at 8¼@8½c.

Nickel remains in a satisfactory position, with quotations unaltered at 65c.

Quicksilver.—The English market is very firm at £7 15s., the price ruling here being $42½ per flask.

Chemicals.—The general tone of the chemical market may be reported as showing no material improvement since last week, and although rumors have been circulated of much more activity in several departments, we have failed to discover any traces of large transactions either for spot or future delivery. On the whole, the tendency is towards firmness, and there is no disposition on the part of sellers here to push business at a decline upon the rates given in our list. This state of things will continue so long as producers are sufficiently wise to follow the course they have lately adopted, of sending to market only such quantities as are needed for the consumptive demand, and thereby avoiding that overgorging with which we have been made so intimately acquainted. There is nothing simpler in the world than to admirably regulate the situation of the chemical market, since, in the absence of speculation, it suffices to ascertain exactly what quantities of the various commodities are likely to be used, and to restrict production as nearly as possible within the required limits. If the manufacturers at large have at length woke up to the advantage of following this policy we shall see good times, but we have little experience to warrant us in supposing this to be the case. The stock of bleaching powder actually available for immediate consumption is very small, and we hear of several sales of jobbing lots at 2¼c. ex store, while it is difficult to buy any thing for delivery between now and the 15th of November at 2c., most sellers being firm in their demands of 2⅛c. per lb.

The demand for both English and American sal soda continues to be good at the prices we quoted last week, and still preserve upon our list. Some 500 tons of English make are reported as having been unshipped during the week, but as it came in fulfillment of contracts, it produced no influence upon current prices, which are firmly held at 1·20c. for small lots from store.

Newcastle and Liverpool brands of ash soda are in somewhat more demand for the interior, but prices have undergone no change. Refined alkali is neglected, only very small sales having been noted of high test, at rather lower rates than obtained last week. The business was, however, of so insignificant a nature that we do not change our official quotation. Caustic soda continues to be dull, the only demand being for 70 per cent and over, with absolute neglect of lower tests. Our latest advices from the English market show that the state of affairs which we are recording is merely a reflection of what prevails over there. There is no activity in the trade. Buyers are holding off, and placing no forward contracts of any importance; and while prices are certainly pretty firm at the moment, because the sellers are tolerably strong holders and the works are not overproducing themselves, the opinion is on the side rather of a fall than of a rise in current rates. Good brands of caustic soda are quoted in Liverpool at £6 5s for 60 per cent., £7 5s. 6d. for 70 per cent., and £8 2s. 6d. for 74 per cent. Sal soda is held at £2 12s. 6d to £2 15s., and bleaching powder is very firm at £7 15s. to £8 for spot, with very little visible supply. We have nothing new to say this week of either brimstone or sulphuric acid, the business in the latter being, while fair, entirely without excitement or change in price.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Oct. 28.

Foundry brands of pig-iron remain scarce, in good demand, and with no change in prices. There seems not to be much disposition to buy in advance of requirements, the general feeling being that prices are not likely to be higher next year, with a slight chance of production being a little ahead of consumption, so that present prices might be shaded in the spring. We do not hear of any new transactions in Northern irons. Southern foundry brands are a little more active, and in addition to the 2200 tons for 1888 delivery reported last week, we note new sales for next year amounting to 1300 to 1500 tons, some of this at concessions from the ruling rates. There is a little more inquiry for Scotch irons, with arrivals of about 800 tons. Quotations are unchanged.

Steel blooms are lifeless. Indeed, in the present state of the rail market it would be impossible to import them. With rails at $34 and blooms about $30, the margin for rolling is not sufficient.

Steel rails are now generally quoted $34 at mill, but this figure would doubtless be shaded in favor of a good customer or for large orders. The orders for next year's delivery thus far entered are not much over 40,000 tons, including 18,000 tons deferred from this year. There are, however, some indications that other orders will soon be placed.

Makers of structural iron continue very busy filling orders.

Discounts on wrought iron pipe have been reduced this week.

Old rails remain the most uncertain article on the list. Small lots are offered at $22.25, with $22 bid. Tees can not be imported under $22.50, and strong holders will store rather than sell at present prices.

The ruling prices will be found in our weekly register of quotations.

Louisville. Oct. 25.

[Reported by GEO. H. HULL & Co.]

While the main features of the market have not changed materially for the past week, yet there is an improvement in the demand, although prices have not been much effected thereby. The demand is principally for mill grades, less being done with foundry and car wheel irons. Lots at furnaces which have been sold for delivery on resumption of navigation are still unmoved. Many buyers are still short of iron and are only buying quantities necessary for immediate use. While many believe the market is weakening, yet the preponderance of opinion is that it must necessarily be stronger. Prices for scrap iron have fluctuated very much of late without apparent reason. Large consumers, who secured quantities of scrap iron when it was low, are inquiring for soft open iron that will carry a large percentage of scrap. Current quotations for cash will be found in our weekly register of prices.

Pittsburg. Oct. 27.

[From our Special Correspondent.]

The position of the iron market remains about the same as last week, so far as the demand is concerned, whilst prices of certain grades are about 25 cents per ton more favorable for buyers than at date of last report. On the other hand there are certain makes of pig-iron for which holders refuse to accept any decline. The market as a whole is certainly weaker, and certain iron brokers report no sales. The stock on hand is by no means large, and no falling off in consumption, and consumers will soon be in want of stock. As one seller remarked, I have just sold Mr. —— 500 tons metal; this is something unusual, as that firm generally purchases thousand ton lots. He remarked he preferred that way at present, and would be round in a few days for more. This case will apply to a number of others. One thing is very evident, there is a lack of confidence in regard to the future, which makes business men cautious. All things considered, there is a very large amount of business being transacted, even if the profits are small. There are less outside lots of raw iron offering than usual. Sellers of that description of iron are not visiting us as often as formerly, or have they found another and more profitable market? City furnaces say they have very little iron for sale and show no anxiety about the future. Many of them are still making iron to fill orders that were entered on their books during the warm weather.

The coke question has not yet been settled. The men that were ordered to strike failed to respond. Mr. Carnegie and Frick are both here, but so far no settlement has been made. The coke men generally say that no advance will be considered, that there is plenty of idle men who are both anxious and willing to go to work at present prices. The week's quotations will be found in our "Weekly Register of Current Quotations." The table should be read carefully, as the changes will be found numerous.

Later report says: The Open-Hearth and Bessemer Steel Manufacturers' National Association, in session at Pittsburg, adjourned on the 27th inst., after adopting a new classification, which, it is said, slightly advances the rates on certain grades of steel. James W. Brown, of Pittsburg, was elected President; Benjamin Atha, of Newark, N. J., Vice-President, and Alexander Guthrie, of New York, Secretary.

SALES SINCE OUR LAST REPORT.

Coal and Coke Smelted Lake Ore.	
500 Tons Bessemer....	21.00 4 mo.
600 Tons Bessemer.	20.50 cash.
500 Tons Gray Forge.....	17.75 cash.
600 Tons Close Gray.....	18.00 cash.
250 Tons Gray Forge.....	18.00 cash.
100 Tons No. 2 Foundry.....	18.75 cash.
20 Tons Foundry	19.25 4 mo.
20 Tons White.....	17.00 cash.
Coke, Native Ore.	
500 Tons Gray Forge...	18.25 4 mo.
500 Tons Gray Forge.....	18.25 4 mo.
100 Tons Gray Forge, extra.....	18.00 cash.
40 Tons No. 2 Foundry...	19.00 4 mo.
20 Tons Silvery...	19.75 4 mo.
20 Tons No. 1 Foundry..	20.25 4 mo.
20 Tons No. 2 Foundry.....	19.00 cash
Charcoal.	
75 Tons No. 2 Foundry.	25 00 cash.
50 Tons Cold Blast...	27.00 cash.
Steel Billets.	
500 Tons Billets	31.50 cash.
Muck Bar.	
700 Tons Muck Bar.....	31.25 cash.

Philadelphia. Oct. 27.

[From our Special Correspondent.]

The volume of business in iron and steel throughout middle and Eastern Pennsylvania has been even lighter than a few days ago. There are more inquiries than usual, but with less buying. Consumers of material, from crude iron up to merchant steel, are awaiting further developments, unwilling to do more than buy for most urgent requirements. This course is explained by some that there is more or less uncertainty felt as to the extent of next winter's house, shop, bridge, railroad, and general construction activity. The prospective condition of the money market will also have more weight with companies pushing large enterprises. A great many are projected and will be undertaken next spring unless something occurs to justify a postponement. In regard to foundry iron, there is any thing but an abundance of brands that are mostly wanted. Inferior brands have been taken frequently of late for prompt delivery but at the average figures. There are several inquiries in to-day for standard brands, but makers would prefer to get nearer to the end of their contracts before taking new orders. No change in quotations. The outlook for forge iron is certainly good. No change in price is to be noted, unless it is in two or three brands, which buyers are, once in a while, anxious to get. Foreign material is almost neglected. There are inquiries for 15 to 20,000 tons of all kinds of material, from billets and blooms down to Bessemer and spiegel. Negotiations have not been closed up to this writing. Anthracite blooms are in better request, and the possibility of a scarcity of coal is interfering with business. Muck bars are in steady request at appended quotations. Merchant iron is not in as active demand as for some time past, and it seems probable now that orders will be light for a week or two longer until the market assumes a better shape. Prices are firm, and there will be no shading until there are some good reasons for such a course. The nail market shows nothing whatever that is new. Plate and tank iron are particularly active, and mill owners report a steady influx of orders, but mostly in small lots. There is no difficulty in obtaining makers' prices. Structural iron is moving, but in small lots at full quotations. Skelp iron is in fair demand, and orders can be had as fast as mills are in condition to take them. The pipe mills have a good deal of winter business in sight. There is a good deal to be said about steel rails, but nothing of a very definite character. The makers think they have, after several quiet meetings, fixed upon a policy that will prevent any further decline, although they decline to state what their programme is for 1888. A large

WEEKLY REGISTER OF

CURRENT QUOTATIONS.

This list is the result of careful compilation and is destined to meet the demands of all classes of subscribers. The prices quoted are those actually ruling in our own and foreign markets. Manufacturers and importers will please give notice of all modifications not later than Friday noon each week.

CHEMICALS.

Acid—Sulphuric, 60°, per 100 lbs..	80
Sulphuric, 66°, per 100 lbs	90
Hydrofluoric, per 100 lbs.....	95
Muriatic, 18°, per 100 lbs	1.15
Muriatic, 20°, per 100 lbs.... . .	1.25
Nitric, 36°, per 100 lbs	4 00
Nitric, 42°, per 100 lbs....	6.00
Alkali—36 p. c	1.10
Refined, 58°	1.15
Alum—Lump, per lb.....	1¾
Ground, per lb	2
Per ton, Liverpool lump	£5
Sulphate of Alumina	£4 12 0
Aluminum—(Metallic), per lb...12.00	
Ammonia—Sulph., per 100 lbs.. 3.00	
Carb , per lb.....	7¾
Muriate, per lb..	7
Antimony—Hallet's, per lb.....	8¼
Cookson's, per lb	9¼
Arsenic—Metallic, per lb.....	3
White, powdered, per lb	2¾
White, glass.	
Red, per lb	6½
Plymouth, white, per ton.....£21 0 0	
Asbestos—American, p. ton.....20 00	
C. i. f. L'pool, Italian, p. ton ...£18 0 0	
Asphaltum—P. ton 13.00	
Barium—(Metallic), per lb.....975.00	
Barytes—Sulph., Am. prime white, p. ton 16.00	
Sulph., foreign, floated, p. ton....19.00	
Sulph., off color, p. ton 12.50	
Carb., lump, f.o.b. L'pool, per ton£6 0 0	
No. 1, casks, Runcorn " "£4 10 10	
No 2, bags, Runcorn " " 3 15 0	
Bismuth—(Metallic), per lb..... 2.40	
Bleach—Over 35 p. c., per lb.....	2
Borax—Per lb	6¼
Refined at Liverpool, per ton..£26 10 0	
Bricks—Pale, per 1,000 ..... 5.00	
Jerseys, per 1,000 .. .. 7.50	
Haverstraw, per 1,000 .... 8.50	
Front bricks, per 1,000, from.....10.00	
Brimstone—*See Sulphur.*	
Bromine—Per lb	36
Building Stone—Amherst free-stone, per cu. ft., from.....	75
Brownstone, per cu. ft., from.....	1 00
Granite, rough, per cu. ft , from..	45
Cadmium—(Metallic), per lb..... 1.45	
Calcium—(Metallic), per oz.....150.00	
Cæsium—(Metallic)	
Cerium—(Metallic) per oz 168	
Cement—Rosendale, per bbl..... 1 00	
Portland, American, per bbl..... .. 2 00	
Portland, foreign, per bbl.... .... 2 25	
Chalk—Per ton..... .... 3.00	
Precipitated, per lb.....	4
China Clay—English, per ton....18.50	
Southern, per ton 13.50	
Chrome Yellow—Per lb	8
Chromium—(Metallic), per lb...200.00	
Cobalt—(Metallic), per lb..... .... 7.00	
Cobalt—Oxide, per lb..... ... 2.15	
Copper—Sulphate English Works, per ton.... ....£13 10 0	
Precipitated, at English Works, per unit.....	7 6
Copperas—Common, per lb.....$ 70	
Best, per lb..... .... 1.20	
Liverpool, per ton, in casks, £2... 1.20	
Cream of Tartar—Am. 99 p. c. per lb	35
Powdered, 99 p c.....	36
Didymium—(Metallic), per oz...160.00	
Emery—Grain, per lb	3½
Flour, per lb	2½
Erbium—(Metallic), per oz.... ...140.00	
Feldspar—Ground, per ton.....14.00	
Fuller's Earth—Lump, per bbl. 95	
Powdered, per lb..	2
Gallium—(Metallic), per oz 3250.00	
Glucinum—(Metallic)	
Green—Emerald, per lb.....	25
Brunswick.....	
Gypsum—Calcined, per bbl.. .... 1.25	
Indium—(Metallic), per oz..... 158.00	
Iodine—Resublimed..... ..... 3.50	
Iridium—(Metallic), per lb.....700.00	
Kainit—Per ton..... ..... 7.25	
Kaolin—*See China Clay.*	
Lanthanum—(Metallic), per oz.175.00	
Lead—Red, per lb.....	6
White, American, in oil, per lb....	6½
White, English, per lb	7½
Acetate, or sugar of.....	12
Litharge—Powdered, per lb	5½
English flake, per lb.....	9
Lithium—(Metallic), per oz.....160.00	
Magnesite—Syrian, per ton.. ...15.00	
Magnesium—Per lb.... .... 4.00	
Mineral Wool—Per lb	2
Molybdenum—(Metallic) per lb 6.00	
Nickel—(Metallic), per lb.. .....125.00	
Niobium—(Metallic), per oz....128.00	
Osmium—(Metallic), per lb 640.00	
Palladium—(Metallic), per lb...512.00	
Platinum—(Metallic), per lb. ..148.00	
Phosphate Rock—S. Carolina, per ton f. o. b. Charleston..... 5.75	
Ground, per ton f. o. b. New York.10.00	
Canadian Apatite, lump, f. o. b. at shipping port, per unit.....	24
Manganese—lump, c. i. f. Liverpool, per ton.....£3 2 6	
Per unit, up or down..... .....£0 1 6	
Ground.... .....£6 0 0	
Metallic, per lb 1.10	
Mercury—*See Quicksilver.*	
Mercuric-Chloride—(*Corrosive Sublimate*) per lb.....	55
Phosphorus—Per lb.....	70
Plumbago—Ceylon, per lb..... .	4
American, per lb..... ...	7
London, per cwt..... .. ..£0 15 0	
Potassium—Metallic, per oz..... 2.00	
Cyanide, per lb.....	
Bromide, per lb.....	37
Chlorate, per lb.....	14
Carb. per lb.	5
Caustic, per lb	7½
Iodide.....	2.10
Muriate, per 100 lbs.....	1.70
Nitrate, refined, per lb.....	6
Bichromate, per lb....	10½
Sulphate, per 100 lbs...	1.10
Yellow Prussiate, per lb....	19
Red Prussiate, per lb...	42
Pumice Stone—Selected lumps, per lb....	2½
Original cks., per lb.....	1½
Powdered, pure, per lb...	1¼
Pyrites—Non-cupreous, per unit, sulph	10
Quartz—Ground, per ton 18.00	
Quicksilver—Per lb. 53	
London, per flask of 75 lbs....£7 12s. 6d.	
Rotten Stone—Powdered, per lb.	8½
Lump, per lb...	5
Eng., powdered, per ton	£4
Lump, per ton.....	£5
Rhodium—(Metallic), per lb....512.00	
Ruthenium—(Metallic), per oz. 112.00	
Rubidium—(Metallic), per oz...200.00	
Salt—Liverpool, ground, per bbl.	70
Turk's Island, per bbl	25
Salt Cake—Per 100 lbs.....	60
Saltpeter—Crude, per lb	4½
Refined, per lb.....	6
Selenium—(Metallic)	
Slate—Purple and green roofing, per 100 sq. ft	6 00
Red roofing, per 100 sq ft... ....15.00	
Black, roofing, per 100 sq. ft. ... 5 00	
Soda Ash—Carbonate, 48 p. c., per 100 lbs.....	1.20
Caustic, 48 p. c., per 100 lbs . .	1.22
Caustic, 70 p. c., per 100 lbs.....	1.13
Sal, English, per 100 lbs..... ..	1.00
Sal, American, per 100 lbs	1.15
Nitrate, per 100 lbs.....	1.95
Sodium—(Metallic) per lb.....	4.00
Strontium—(Metallic), per oz..138 00	
Nitrate, per lb	10½
Sulphur—Roll, per lb.....	1½
Flour, per lb	1¾
Crude Brimstone, seconds, per ton..... .... 20.00	
Crude Brimstone, thirds, per ton..19.00	
Talc—Ground French, per lb.. ...	1¼
Domestic, per lb.....	6
Domestic, per ton..... ... .15 00	
C. i. f. Liverpool, per ton.... .. £4 5 0	
Tannin—Pure, per lb.	
Tantalum—(Metallic) per oz .. 144.00	
Tellurium—(Metallic) per oz.... 9.00	
Thallium—(Metallic) per oz..... 3.00	
Titanium—(Metallic) per oz....32.00	
Thorium—(Metallic) per oz 272.00	
Tungsten—(Metallic) per oz..... 4.00	
Vanadium—(Metallic), per oz..320.00	
Vermilion—American, per lb... 50	
English, per lb.	65
Vitriol—(Blue), Ordinary, per lb..	4½
Extra, per lb	4¾
Yttrium—(Metallic), per oz 144.00	
Zinc Oxide—American, Dry, per lb.....	4¼
Antwerp, Red Seal, per lb.....	5⅝
Paris, Red Seal, per lb.....	6⅛
Zirconium—(Metallic), per oz..240.00	

IRON AND STEEL.

New York Prices.

American Pig-Iron,

No. 1 X ..... $21@$21.50 at tidewater.
No. 2 X..... $18 50@$19.50 " "
Forge.. .. ... $17@ . .... " "

Scotch Pig—Coltness... .$21.50@$21.75
Clyde .... 19.75@ 20.00
Dalmellington..... 19.75@ 20 00
Summerlee..... 21.00@ 21.25
Gartsherrie..... ..... 21 00@ 21.25
Shotts... .... 21.00@ 21.25

By Cable to day to the Metal Exchange :

Scotch Warrants.....39s. 1d.
Coltness, at Glasgow .... .50s. 9d
Langloan, at Glasgow.....47s. 0d.
Summerlee, at Glasgow..... 49s. 6d
Gartsherrie, at Glasgow.... .....46s. 3d.
Glengarnock, at Ardrossan.....47s. 8d.
Dalmellington, at Ardrossan.....42s. 6d.
Eglinton, at Ardrossan ... .41s. 6d.

Bessemer Pig—
Foreign, nominally..... $19.75@$20.00
Domestic, $19.25 at Eastern furnaces.
Spiegeleisen—
German, 20 per cent..... $26.00
English, 20 " " 26 50
" 30 " " 31.00
Ferro Manganese..... 56.00
Steel Blooms.....$30.00@ 30.50
Steel Billets .... 30.00@ 30.50
Steel Nail Slabs.. ..... 30 50@ 31.00
Steel Wire Rods.. ....$40.00@$40.50
Steel Rails—
Heavy sections, at mill....$34.00@ .....
Light " " .... 36.00@ 40 00
Structural Iron and Steel—
Bridge Plate, at mill.. ....2¼@2·3c.
Angles, at mill ....2·3@2·6c.
Tees, at mill..... .....2 6@2 8c.
Steel Angles, at mill..... ....2·6@2·75c.
Beams and Channels, on wharf, 3·5c. base.
Steel Plates—
Tank and Ship, on wharf.. .... 2·85@3c.
Boiler shell, on wharf... ....3 @3¼c.
" Flange, " .... 3½ @3¾c.
" Fire-Box, on wharf.....4 @4½c.
Iron Plates—
Common tank, on wharf. . . .2·4@2·5c.
Refined tank, on wharf..... .2 5@2 6c.
Boiler shell, " ..... .2·7@2 8c.
Boiler flange, " ....3·7@3 8c.
Extra flange, " .....4¼@4½c.
Bar Iron—
Refined..... .....2@2·1c. base.
Common..... 1·9@2c. "
Merchant Steel—
American tool .... 7½@10c.
Special grades..... 10 @20c.
Crucible machinery ..... 4½@6c
" spring..... ... 4 @4½c.
Bessemer machinery..... 2·7@3c.
" spring. . . .. 2·7@3c.
Cast-Iron Pipe—
According to size..... $30 00@$36.00
Wrought Iron Pipe—List of Edw. Barr Co., Ltd., adopted Oct. 26, 1887.
Butt-Welded, Plain and Tarred, 47½ per cent disc ; Galv., 37½ per cent disc.
Lap-Welded, Plain and Tarred, 57½ per cent disc ; Galv., 45 per cent disc.
Boiler Tubes—52½ per cent disc.; Casing, 50 per cent disc.
Bail Fastenings—
Spikes..... ... . 2·3 @2·4c.delv'd
Angle Fish-bars..... .2·15@2·2c.
Bolts and Sq. Nuts .....2·9 @ 3c.
" " Hex " . .....3·1 @3·2c.
Wrought Scrap—
Foreign *ex ship*.....$20.50@$21.00
No. 1 Yard .... 21.50@ 22.00
Cast Scrap ....$15.00@$17.50
Old Car Wheels..... .... 19.00@ 19.50
Old Rails—Tees ... . 22.00@ 22.25
—Doubles ..... 22 50@ 23.00
Nails—In car-load lots. .. 2.00@ 2.05
—From store .... 2.05@ 2.10

Philadelphia Prices.

Foundry No. 1.....	$21.00@22.00
Foundry No. 2.	18.50@19.50
Gray Forge.....	17.00@17.50
Bessemer Pig.....	20.50@21.00
Steel Rail Blooms	.....@31.50
Foreign Bessemer.....	20.50@.....
Spiegeleisen.	27.00@27.50
Scrap, Selected.....	23.50@. ....
No. 1.....	21.00@22.00
Cargo Scrap.....	22.00@.....
Muck-Bars..	31.00@31.50
Merchant Iron.....	2@2.10c.
Plate Iron.....	2.30@ 2.50
Tank Iron.....	2.40@ 2.50
Skelp Iron.....	1.95@ 2.00
Angles.....	2.30@.. ..
Beams and Channels..... ..	3.30@. ....
Nails	2.10@ 2.25
Steel Rails.	36.00@38.00
Old Rails.....	23.50@24.00

Pittsburg Prices.

Coke or Bituminous Pig—

Foundry No. 1..... ... ..$19.75@20.00	
Foundry No. 2.....	18.75@19.00
Gray Foundry No. 3.....	17.75@18.00
" " No. 4....	17.50@17.75
White	17.00 ..
Mottled....	17.00@19.00
Silvery	19.00 .....
Bessemer.....	20.50@20.75

Charcoal Pig—

Foundry No. 1.	25.00@25.75
Foundry No. 2.....	24.00@24.75
Cold-Blast.....	26.00@30.00
Warm-Blast.....	25.00@27.00
20 p. c. Spiegel.....	28.00@29.00
Muck-Bar.....	31.00@31.25
Steel Blooms.....	32.00@33.00
Steel Slabs.....	31.00@32.00
Steel Crop Ends....	20.00
Steel Bloom Ends..	21.00@21.50
Steel Billets.....	31.00@32.00
Old Iron Rails...	25.25@25 75
Old Steel Rails.....	24.50@24.52
No. 1 W. Scrap.....	20 50@21.00
No. 2 W. Scrap.....	19.00@19.50
Steel Rails.....	36.00@37.00
" light sections...	37.00@41.00
Bar Iron., nominal.....	1.90@ 2.00

Nails $2 net car lots.
Steel Nails $2 net car lots. Two per cent offfor cash.

Louisville Prices.

Pig-Iron—

So. Coke, No. 1 Foundry..$20.50@$21.00	
" " No. 2 " .. 19.50@ 20.00	
" " No. 2½ " .. 18.50@ 19.50	
Hg. Rock Coke, No. 1 F'dry 20.00@ 21.50	
" " Charcoal, No. 1 Foundry ..... 23.00@ 24.50	
So. Charcoal, No. 1 F'dry .. 21.00@ 22.00	
Silver Gray, different gr'des 17.50@ 19.00	
So. Coke, No. 1 Mill, Neutral 17.50@ 18.50	
" " No. 2 " " 17.00@ 18.00	
" " No. 1 Mill, Cold Short.... ..... 17.00@ 18.00	
So. Charcoal, No. 1 Mill....	
White&Mottled. diff't gr'ds. 15.50@ 16.00	
So. Car-Wheel, St'rd Br'nds 24.00@ 25.00	
" " Other " 22.00@ 24.00	
Hanging Rock, Cold-Blast.. 24.50@ 26.00	
" " Warm-Blast 21.00@ 22.50	

STOCK MARKET QUOTATIONS

Baltimore Stock Quotations.

COMPANY.	Bid.	Asked.
Atlantic Coal....$1.40		$1.50
Balt. & N. Co ... .30@.36		.45
Big Vein Coal..		1.25
Conrad Hill . .. .10		.20
Diamond Tunnel .40@.45		.45@ 48
George's Crk. C..85.00		95 00
N. State. Balto..		.80
Ore Knob 05		.10
Silver Valley 1.55		1.60@1.85

Highest and lowest prices bid and asked during the week ending October 27th.

Birmingham, Ala., Stock Quot.

COMPANY.	Bid.	Asked.
Ala. Conn. C.. ...		100
Bir. Min. & Mfg. 125		175
Decat. L. Imp. & Fur.....	23 @ 25¾	24½@ 27
DecaturMin. L.	29	32½@ 33½
Enterprise Mfg	6	7½
Sloss I. & S....	30	34 @ 37
* Sloss I. & S..		88
Sheffield C & I.	†70 @†74	71½@ 74½
WoodstockS&I	50	....

* Bonds. † Buyer 60 days.

Highest and lowest prices bid and asked during the week ended October 25th.

Deadwood-Dak. Quotations.

Comp'y.	H.	L.	Comp'y.	H.	L.
Bullion...	.05	.01½	Rattler. .	.25	.15
C'nt'e Sh't	.02	.02	Seabury..	.16	.16
Ent'rp'se.	.02½	.01	Seg'eg'ted	.08	.05
Hester A.	.05	01½	Silv'r Kid'e	.01½	.00½
Iron Hill.	3.50	2.91	Sp'nish R.	.25	.22
Minna ...	.02	.02	West Va		...
Mutual. ..	.11	07			

Highest and lowest prices bid and asked during the week ended October 22d.

Pittsburg Stock Quotations.

COMPANY.	H.	L.	Closing.
Bridgewater Gas ..	99.00	99.00	99.00
Chartiers Val. Gas.	87.00	80.00	83.00
Columbia Oil Co..	.25	.25	.25
Consignee Min. Co.	.....	.....	.....
Forest Oil Co . ..	95.00	95.00	95.00
La Noria Mining ..	4.25	3.87½	4.12½
M'f'turers' Gas....	25.00	25.00	25.00
Mansfi'd C.& C.Co.	35.00	35 00	35.00
Nat. Gas Co., W. Va.	102.00	102.00	102.00
N. Y. & Cleve. Gas Coal.....	44.00	44.00	40.00
Ohio Valley Gas...	.....	.....	.....
Pennsylvania Gas.	25.00	20.00	21.00
Philadelphia Gas..	48.12½	47.75	48.00
Pine Run Gas Co..	.....	.....	.....
Pleasant Valley...	.....	.....	.....
Tuna Oil Co.....	65.00	65.00	65.00
W't'h'se Air-Brake.	114.00	112.50	114.00
W't'ghouse Brake.	.....	.....	.....
Westmoreland Cambria Gas	51.00	51.00	51.00
Wheeling Nat. Gas.	28.00	26.00	27.50
Yankee Girl Mining	. ....	.....	.....

Highest and lowest prices bid and asked during the week ending October 26th.

London Quotations.

COMPANY.	Highest.	Lowest.
Alturas Gold, Idaho...	15s.	14s.
Anglo-Montana, Mont..	....	...
Arizona Copper, Ariz..	£⅛	£⅜
Birdseye Creek, Cal....	10s.	8s.
California Gold, Colo..	9s.	8s.
Carlisle, N. Mex	£1¼	£1
Centennial, Cal.	£1	£¾
Charles Dickens, Id....	7s.	6s.
Colorado United, Colo..	£⅜	£⅝
Denver Gold, Colo.....	2s. 6d.	1s. 6d.
Eberhardt, Nev.	7s.	6s.
Empire, Mont	£3¼	£3
Flagstaff, Utah.....	5s.	4s.
Garfield, Nev....	£1⅛	£1
Gold Hill, N. C.....	2s. 6d.	2s.
Kohinoor, Colo.....	2s. 6d.	1s. 6d.
Montana Lt., Mont	£7⅛	£6⅞
New California, Colo...	9s.	8s. 6d.
New Consolidated	3s.	2s.
New Emma S., Utah...	4s. 6d.	3s. 6d.
New Hoover Hill, N. C.	3s.	2s.
New La Plata, Colo...	3s. 6d.	3s.
Plumas Eureka, Cal....	£⅜	£⅝
Richmond Con., Nev...	£4⅞	£4⅝
Ruby&Dunderberg, Nev	5s.	4s.
Russell Gold, N. C.....	2s. 6d.	2s.
Sierra Buttes, Cal.....	£1⅛	£⅞
Union Gold, Colo.....	15s.	10s.
Viola Lt., Idaho	£1¼	£1

Highest and lowest prices October 15th.

amount of business is offered under $34, but, so far as known, no orders have gone in at less. The supply of old rails is large, and there are offers at $22, but an upward tendency is at work on account of the coming of cold weather, when it will be more difficult to move stock. For quotations, we refer to our "Weekly Register of Current Quotations."

FINANCIAL.

NEW YORK, Friday Evening, Oct. 28.

The Condition of Trade.

General trade continues in moderately active volume throughout the country as compared with a few preceding weeks, but on the whole remains in excess of the total one year ago. The widely published reports of slow collections, owing to "short crops," are based upon a superficial view of the situation. The wheat crop is about an average ; that of Indian corn is a fair average. Cotton promises to give a large crop, and oats and barley have yielded good harvests. The shortages must be confined to potatoes, but

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last.			Dividends. Total paid.	Dividends. Date and amount of last.		
1	Adams, S. L.	Colo.	$1,500,000	150,000	$10	*				$555,000	Jan.	1887	15
2	Alice, S. C.	Mont	10,000,000	400,000	25	*				750,000	Sept	1886	.06¼
3	Alturas, G	Idah.	1,500 000	300,000	5					95,000	Sept	1886	.50
4	Amie Con., S. L	Colo.	5,000,000	500,000	10	*				330,000	Oct.	1883	.05
5	Amy & Silversmith, S.	Mon.		341,419						247,530	Aug.	1887	.12½
6	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	360,000	Jan.	1887	1.00
7	Argenta, S	Nev..	10,000,000	100,000	100	295,000	July	1885	.10	40,000	Feb.	1880	20
8	Aurora, I.	Mich	2,000,000	100,000	20					155,000	Oct.	1887	1.87½
9	Bassick, G. S.	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00
10	Belle Isle, S.	Nev..	10,000,000	100,000	100	160,000	Feb	1887	.20	300,000	Dec.	1879	.25
11	Belcher, G. S.	Nev..	10,400,000	104,000	100	2,269,335	Sept	1887	50	15,397,000	Apl.	1876	1.00
12	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	26,250	Dec.	1883	10	200,000	Jan	1887	.10
13	Big B'nd Hydraulic, G	Dak..	1,000,000	200,000	5	*				258,000	Aug	1887	.03
14	Black Bear, G.	Cal..	3,000,000	30,000	100	22,500	Dec.	1884	.25	895,000	May	1883	.20
15	Bodie Con., G. S.	Cal..	10,000,000	100,000	100	424,990	Aug	1887	.50	1,602,572	Apl.	1885	.50
16	Bonanza Developm't	C & M	3,000,000	300,000	10					135,000	Oct.	1882	.15
17	Bonanza K'g, Cons. S.	Cal..	1,000,000	100,000	10	*				185,000	Feb.	1883	.10
18	Boston & Mont, G.	Mont	2,500,000	250,000	10	*				520,000	Jan.	1886	.15
19	Breece, S.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01
20	Brooklyn Lead, L. S	Utah	500,000	50,000	10					127,000	July	1887	.05
21	Buiwer, G.	Cal	10,000,000	100,000	10	60,000	July	1887	20	175,006	Jan.	1884	.10
22	Caledonia, G.	Dak	10,000,000	100,000	100	505,000	May	1885	.15	40,000	Feb.	1886	.10
23	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000				29,350,000	July	1887	5.00
24	Carbonate Hill, S. L.	Colo.	2,000,000	200,000	10	*				80,006	Apl.	1884	.05
25	Caribou Con., S.	Colo.	1,500,000	150,000	10	*				50,000	Mch	1880	.10
26	Castle Creek, G.	Idah.	100,000	100,000	1					51,000	Oct.	1883	.03
27	Catalpa, S. L	Colo.	3,000,000	300,000	10	*				270,000	May.	1884	.10
28	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,820,000	Feb.	1887	2.00
29	Christy, S.	Utah	10,000,000	100,000	100					10,000	Jun.	1885	.10
30	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*				1,680,000	Dec.	1884	.25
31	Colorado Central, S. L	Colo.	2,750,000	275,000	10	*				227,625	Oct.	1887	.05
32	Cons. Cal. & Va., G. S.	Nev..	21,600,000	216,000	100	108,000	Jan.	1885	.20	1,144,000	Oct.	1887	.50
33	Con. Gold Mining, G.	Ga...	500,000	100,000	5	*				108,000	Nov.	1883	.02
34	Contention, S	Ariz.	12,500,000	250,000	50					†2,587,000	Dec.	1884	.25
35	Crescent, S. L. G.	Utah	15,000,000	600,000	25	‡				210,000	Aug.	1886	.05
36	Crown Point, G. S.	Nev..	10,000,000	100,000	100	2,675,000	Feb.	1882	.25	11,588,000	Jan.	1875	2.00
37	Daly, S. L.	Utah	3,000,000	150,000	20	*				300,000	Sept	1887	.50
38	Deadwood-Terra, G.	Dak..	5,000,000	200,000	25	*				§980,000	Oct.	1887	.10
39	Derbec B. Grav., G. S.	Cal..	10,000,000	100,000	100	90,000	Dec.	1881	.10	180,000	May	1887	.10
40	Dunkin, S. L.	Colo.	5,000,000	200 000	25	*				950,000	Oct	1887	10
41	Elkhorn, G. S.	Mont	1,000,000	100,000	10	50,000	July	1883	.50	180,000	July	1887	.05
42	Empire Lt., G.	Mont	530,000	100,000	5					33,000	Mar	1887	.05
43	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	500,000	July	1883	1.00	4,855,500	Nov.	1887	.25
44	Evening Star, S. L.	Colo	500,000	50,000	10	*				1,400,000	Nov	1883	.50
45	Excelsior, G.	Cal..	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct.	1880	.25
46	Father de Smet, G.	Dak.	10,000,000	100 000	100	200,000	Nov	1878	1.00	1,125,000	Dec.	1885	.20
47	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun.	1871		560,000	Dec.	1886	1.00
48	Freeland, G. S. C.	Colo	5,000,000	200,000	25	*				190,000	July	1886	.10
49	Fresno Enterprise, G	Cal..	5,000,000	100,000	50			Mch	1883	.10	110,000	July	1882	.10
50	Garfield Lt., G. S	Nev	500,000	100,000	5					25,000	Mar.	1885	.12½
51	Gould & Curry, G. S.	Nev.	10,800,000	108,000	100	4,159,400	Jun.	1887	.50	3,826,000	Oct.	1870	10.00
52	Grand Central, S.	Ariz.	1,000,000	100,000	10					625,000	Dec.	1882	.25
53	Grand Prize, S.	Nev.	10,000,000	100,000	100	570,000	Apl.	1886	.50	495,000	Mar.	1884	.25
54	Granite, S.	Colo.	125,000	125,000	1					6,250	Mar	1883	.01
55	Granite Mountain, S.	Mont	10,000,000	400,000	25					3,400,000	Nov.	1887	.50
56	Green Mountain, G.	Cal..	1,250,000	125,000	10					212,000	Nov.	1881	.07½
57	Hale & Norcross, G. S	Nev.	11,200,000	112,000	100	5,086,800	July	1887	.50	1,598,000	Apl.	1871	5.00
58	Hall-Anderson, G.	N. S.	150,000	150,000	1					7,000	Jan.	1882	.05
59	Hecla Con., G. S. L. C.	Mont	1,500,000	300,000	50					1,047,000	Aug.	1886	.50
60	Hel'a Mg & Red, G. S. L	Mont	3,315,000	663,000	5	*				197,970	July	1886	.06
61	Holmes, S.	Nev..	10,000,000	100,000	100	300,000	Sept	1885	10	75,000	Apl.	1886	.25
62	Holyoke, G.	Idah.	200,000	200,000	1					27 000	Feb.	1883	.10
63	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	3,943,750	Oct.	1887	.20
64	Honorine, S. L.	Utah	500,000	250,000	2	25,000	Jun.	1883		125,000	Sept	1887	.05
65	Hope, S.	Mont	1,000,000	100,000	10	*				183,252	Oct.	1887	.25
66	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*				4,000,000	Nov.	1884	.50
67	Idaho, G.	Cal..	310,000	3,100	100					4,339,500	Apl.	1887	5.00
68	Ideal, S. L.	Colo.	1,500,000	50,000	10					15,000	Oct.	1886	.05
69	Illinois, S.	N.M.	100,000	100,000	1	*				25,000	Jan	1887	.25
70	Independence, S.	Nev..	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
71	Indian Queen, S.	Nev..	250,000	125,000	2	*				368,750	July	1883	03
72	Invo, G.	Cal..	500,000	100,000	5	*				45,000	Apl.	1882	.05
73	Iron Hill, S.	Dak.	2,500,000	250,000	10	82,500	Oct.	1885		137,500	Oct.	1887	.05
74	Iron-Silver, S. L.	Colo.	10,000,000	500,000	20	*				2,100,000	Oct.	1887	.20
75	Jackson, G. S.	Nev	5,000,000	50,000	100	10,000	Nov	1880	.20	45,000	Oct.	1884	.10
76	Jocuistita, S.	Mex.	2,500,000	250,000	10					1,200,000	Feb.	1885	.50
77	Jumbo, G.	Colo.	2,000,000	200,000	10					15.000	Jun.	1887	.02½
78	Kentuck	Nev..	3,000,000	30,000	100	342,000	Nov	1881	.30	1,800,000	Dec.	1886	.10
79	La Plata, S. L.	Colo.	2,000,000	200,000	10	*				610,000	Sept	1882	.30
80	Leadville Cons., S. L.	Colo	4,000,000	400,000	10	*				430,000	Apl.	1887	.05
81	Lexington, G. S.	Mont	4,000,000	40,000	100	*				565,000	Jan.	1885	2.00
82	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*				780,000	Mch	1885	.10
83	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*				1,050,000	Mch.	1880	50
84	Manhattan, S.	Nev	5,000,000	50,000	100	300,000	Jun	1887	1.00	437,500	Feb	1886	.25
85	Marguerite, G.	Cal..	500,000	25,000	20					18,750	Oct.	1882	.25
86	Marion Bullion, G	N.C	500,000							15.000	Jan.	1886	
87	Martin White, S.	Nev..	10,000,000	100,000	100	1,150,000	Mar.	1886	25	140,000	Dec.	1886	.25
88	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*				87,500	Sept	1887	5.00
89	Minnesota, C.	Mica	1,000,000	40,000	25	420,000	Apl.	1886	1 00	1,826,000	Mar.	1876	
90	Mono, G.	Colo.	5,000,000	50,000	100	610,000	Sept	1887	.50	12,500	Mar.	1887	.25
91	Montana, Lt., G. S.	Mont	3,300,000	660,000	5	*				1,247,400	July	1887	.75
92	Morning Star, S. L.	Colo.	1,000,000	100,000	10					725,000	July	1887	.25
93	Moulton, S. G.	Mont	2,000,000	400,000	5	*				350,000	May	1887	.07½
94	Mount Pleasant, G.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
95	Mt. Diablo, S	Nev	5,000,000	50,000	100	137,500	Jun.	1880	2.00	80,000	July	1885	.20
96	Napa, Q.	Cal..	700,000	100,000	7					390,000	Jan.	1883	.10
97	Navajo, G. S.	Nev..	10,000,000	100,000	100	450,000	Mar.	1887	30	325,000	Feb.	1885	.25
98	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06½
99	New York Hill, G.	Cal..	5,000,000	50,000	100	62,500	Oct	1885	.15	215,000	Aug.	1882	.10
00	Northern Belle, S.	Nev..	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	Apl.	1883	.50
101	North Belle Isle, S.	Nev..	10,000,000	100,000	100	250,000	Mar.	1887	.50	30,000	Aug.	1881	.15
102	Ontario, S. L.	Utah	15,000,000	150,000	100					8,675,000	Oct.	1887	.50
103	Ophir, G. S.	Nev..	10,000,000	100,000	100	4,057,800	Aug	1887	.50	1,595,000	July	1882	1.00
104	Original, S. C.	Mont	1,500,000	60,000	25	*				126.000	Oct.	1887	.05
105	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1878	1.60	1,022,500	Jan.	1887	1 00
106	Oxford, G.	N. S.	125,000	125,000	1	*				34,500	Oct.	1885	.02
107	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	47,000	Mar.	1882	.15	150,000	Apl.	1887	.10
108	Parrott, C.	Mont	1,800,000	180,000	10					36,000	July	1887	.10
109	Peacock, S. G. C.	N.M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
110	Pleasant Valley, G. S.	Cal..	10,000,000	100,000	100	10,000	Mar.	1884	.10	30,000	Dec.	1882	.05
111	Plutus, G. S. C. L.	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
112	Plymouth Con., G.	Cal..	5,000,000	100,000	50	*				2,160,000	Nov.	1887	.40
113	Prussian, S. L.	Colo.	1,500,000	150,000	10					132,000	Jan.	1883	.10
114	Quicksilver, pref., Q.	Cal..	4,300,000	43,000	100					914,150	Aug.	1887	1.50
115	" com., Q.	Cal..	5,700,000	57,000	100					151,000	July	1882	.40
116	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec.	1862		4,610,000	Aug.	1887	1.00
117	Richmond, S. L.	Nev..	1,350,000	54,000	25	*				4,312,587	Jun.	1887	1.25
118	Ridge, C.	Mich.	500,000	20,000	25	220,000	Mar	1886	.50	100,000	Feb.	1880	.50
119	Rising Sun, S.	Dak.	750,000	150,000	5	*				52,000	May	1881	.07½
120	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
121	Robert E. Lee, S. L.	Colo	10,000,000	500,000	20	*				100,000	Dec.	1882	.50
122	Rooks, G.	Vt.	500,000	50,000	10	*				61,000	Apr	1885	.40
123	Savage, S.	Nev..	11,200,000	112,000	100	6,324,000	Sept	1887	50	4,460,000	July	1869	3.00
124	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*				50,000	July	1884	
125	Shoshone, G.	Idah.	150,000	150,000	1					7,500	Apl.	1883	.01
126	Sierra Buttes, G.	Cal..	225.000	22,500	10					1,438,964	Oct.	1886	.37
127	Sierra Grande, S.	N. M.	2,500,000	500,000	5					860,000	Sept	1884	.25
128	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,262,000	Aug.	1887	.25	102,000	Jan.	1871	1.00
129	Silver Cord, G. S. L.	Colo.	5,000,000	500,000	10					225,000	Nov.	1883	.25
130	Silver King, S.	Ariz.	10,000,000	100,000	100					2,000,000	July	1887	.25
131	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*				76,000	Nov.	1886	.02
132	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*				3,012,500	Oct.	1887	.20
133	Smuggler, S. L.	Colo.	600,000	60,000	10					60,700	Aug.	1883	.25
134	Socorro, C.	N. M.	250,000	2,500	100					4,000	Mch	1882	.06¼
135	South Yuba, G.	Cal..	2,000,000	40,000	50	*				150,000	Oct.	1881	.75
136	Spring Valley, G.	Cal..	200,000	2,000	1	50,000	Oct.	1886	.25	50,000	Jan.	1881	.25
137	Standard, G. S.		10 000,000	1 40,000	100	25,000	Oct.	1884	.25	3,535,000	Nov.	1887	.05
138	Stormont, S.	Utah	500,000	500,000	1	*				155,000	Nov.	1881	.05
139	St. Joseph, L.	Mo..	1,500,000	150,000	10	*				814,000	Sept	1887	.20
140	Surinam, G.	D. G.	3,000,000	600,000	5					75,000	Oct.	1887	.05
141	Syndicate, G.	Cal..	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885	.10
142	Tip Top, S.	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov.	1881	.20
143	Tombstone, G. S. L.	Ariz	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10
144	United Verde, C.	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.20
145	Valencia, M.	N. H.	150,000	1,500	100	*				37,500	Apl	1886	2.50
146	Viola Lt., S. L.	Idah.	750,000	150,000	5	*				74,500	May	1887	.12½
147	Vizina, S.	Ariz.	5,000,000	200,000	25	*				140,000	Apl.	1882	.10
148	Yankee Girl	Colo.	2,500,000	250,000	10					1,087,500	July	1887	.10
149	Yellow Jacket, G. S.		12,000,000	120 000	100	5,448 000	Dec	1885	.75	2,184,000	Aug.	1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied.	Assessments. Date & am'nt. of last.			
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*				
2	Albion, S. L.	Nev..	15,000,000	150,000	100	$577,000	July	1883	.25	
3	Allouez, C.	Mich	2,000,000	80,000	25	240,000	Feb	1884		
4	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	460,000	Aug.	1887	.50	
5	Alta, S.	Nev..	10,080,000	100,800	100	2,027,000	Feb	1887	.50	
6	Amador, G.	Cal..	400,000	200,000	2	*				
7	American Flag, S.	Colo.	1,250,000	125,000	10	300,000	Jun	1877	.50	
8	Anglo-Montana, Lt.	Mon.	600,000	120,000	5					
9	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5					
10	Aspen Mg. & S., S. L	Colo.	2,000,000	200,000	10					
11	Barcelona, G.	Nev..	5,000,000	200,000	25	*				
12	Bechtel Con., G.	Cal..	10,000,000	100,000	100	173,500	Jan.	1883	.10	
13	Belmont, S.	Nev..	5,000,000	50,000	100	735,000	Apl.	1886	.10	
14	Best & Belcher, G. S.	Nev..	10,080,000	100,800	100	1,900,590	Aug.	1887	.50	
15	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*				
16	Bi-Metallic, S.	Mon.	5,000,000	200,000	25	*				
17	Black Jack, G.	Cal..	250,000	100,000	2½					
18	Boston Con., G.	Cal..	13,000,000	100,000	100	170,000	Nov	1883	.25	
19	Bradshaw, S.	Ariz.	2,250,000	225,000	10					
20	Brunswick, G.	Cal..	2,000,000	400,000	5	*				
21	Bullion, G. S.	Nev..	10,000,000	100,000	100	5,050,000	Aug.	1887	.50	
22	Bve and Bye	Ariz.	1,000,000	100,000	10	*				
23	Calaveras, G.	Cal..	500,000	500,000	1	*				
24	Carisa, G.	Wy.	500,000	100,000	5	*				
25	Cashier, G. S.	Colo.	500,000	250,000	2	*				
26	Cen Contin'l, G. S. L.	C. & A	2,000,000	200,000	10	*				
27	Charles Dickens, G. S.	Idah.	1,250,000	250,000	5	*				
28	Cherokee, G.	Cal..	1,500,000	150,000	10					
29	Chollar, S.	Nev..	11,200,000	112,000	100	1,152,000	Aug.	1887	.50	
30	Cinnamon Mt., G. S.	Colo.	750,000	150,000	5					
31	Climax, S. L.	Colo.	2,000,000	200,000	10	*				
32	Colorado No. 2, S. L.	Colo.	100,000	10,000	10					
33	Comstock, G. S.	Nev..	10,000,000	100,000	100	30,000	Mar.	1887	.15	
34	Con. Imperial, G. S.	Nev..	5,000,000	50,000	100	1,175,000	Sept	1887	.25	
35	Con. Pacific, G.	Cal..	6,000 000	60,000	100	183,000	Sept	1887	.15	
36	Cons Silver, S	Mo...	2,500,000	250,000	10					
37	**Cop. Queen Cons, C.	Ariz	1,400 000	140,000	10					
38	Courtlandt	Colo.	500,000	50,000	10					
39	Crescent, S. L.	Colo.	3,000,000	300,000	10	*				
40	Crocker, S.	Ariz.	10,000,000	100,000	100	75,000	May	1887	.10	
41	Crowell, G.	N. C.	500,000	500,000	1					
42	Dahlonega, G.	Ga...	250,000	250,000	1	*				
43	Dandy, S.	Colo.	5,000,000	500,000	10					
44	Dardanelles, G.	Cal..	1,000,000	100,000	10					
45	Decatur, S.	Colo.	1,500,000	300,000	5	*				
46	Denver City, S. L.	Colo.	5,000,000	500,000	10	*				
47	Denver Gold	Colo.	300,000	60,000	5					
48	Deseret, G. S.	Utah	500,000	50,000	10	*				
49	Dunderberg, S.	Colo.	1,500,000	150,000	10	*				
50	Durango, G.	Colo.	500,000	500,000	1	*				
51	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000	Mar.	1886	1.00	
52	El Cristo, G. S.	U.S.C	1,000,000	500,000	2					
53	El Dorado, G	Cal.	1,000,000	250,000	4	*				
54	El Talento, G.	U.S.C	1,000,000	500,000	2					
55	Empire, S.	Utah	10,000,000	100,000	100					
56	Enterprise, S. L.	Colo.	800,000	80,000	10	*				
57	Eureka Tunnel, S. L.	Nev..	10,000,000	100,000	100	*				
58	Exchequer	Nev..	10,000,000	100,000	100	880,000	July	1887	.20	
59	Found Treasure, G. S.	Nev..	10,000,000	100,000	100					
60	Gold Cup, S.	Colo.	500,000	500,000	1					
61	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25	
62	Gold Rock, G.	Cal.	1,000,000	500,000	2	*				
63	Goodsnaw, G.	Cal..	10,000,000	100,000	100	*				
64	Grand Belt, C.	Tex.	12,000,000	120,000	100					
65	Grand Duke	Colo.	800,000	80,000	10					
66	Great Romance, G.	U.S.C	1,000,000	500,000	2	*				
67	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*				
68	Gregory Con., G.	Mon.	3,000,000	300,000	10					
69	Harlem M. & M. Co, G.	Cal..	1,000,000	200,000	5					
70	Head Cent. & Tr. S. G	Ariz.	10,000,000	100,000	100					
71	Hector, G.	Cal..	1,500,000	300,000	5					
72	Highland, C	Mich	500,000	25,000	25					
73	Hortense, S.	Colo.	2,000,000	200,000	10					
74	Huron, C.	Mich	1,000,000	40,000	25	280,000	May	1887	2 00	
75	Iron Gold & Silver, S	N. M.	2,000,000	200,000	10					
76	Iroquois, C	Mich	1,250,000	50,000	25					
77	J. D. Reymert	Ariz	10,000,000	100,000	100	*				
78	Julia Cons., G. S.	Nev..	11,000,000	110,000	100	1,452,000	Apl.	1887	.10	
79	Kearsarge, C.	Mich	1 250,000	50,000	25	150,000	Oct.	1887	1.00	
80	Laclede	N. M.	2,000,000	200,000	10					
81	Lacrosse, G.	Colo.	1 000,000	100,000	10	*				
82	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	*				
83	Lucerne, S.	Colo.	5,000,000	500,000	10	*		Jan.	1885	.10
84	Mammoth Bar., G.	Cal..	10,000,000	100,000	100	50,000	Dec.	1881		
85	Mariposa pref., G.	Cal..	5,000,000	50,000	100	1,687,500	Feb.	1883	.25	
86	common, G.	Cal..	10,000,000	100,000	100	1,975,000	Dec.	1881	.20	
87	May Belle, G.	Cal..	10,000,000	100,000	100	84,000	Mar.	1884	.15	
88	Mayflower Gravel.	Cal..	1 000,000	100,000	10	235,000	Sept	1887	.25	
89	Medora, G	Dak.	25 000	250,000	1					
90	Mexican, S.	Nev..	10,000,000	100,000	100	2,615,960	July	1887	.25	
91	Middle Bar G.	Cal.	400,000	200,000	2	*				
92	Mike & Starr, S. L.	Colo.	1,000,000	200,000	5	*				
93	Monitor, G.	Colo.	100,000	100,000	1	*				
94	Moose Silver, S.	Colo.	3,000,000	300,000	10	*				
95	Nachoochee, Lt., G.	Ga...	1,000,000	200,000	5					
96	Neath, G.	Colo.	1,000,000	100,000	10					
97	Nevada Queen, S.	Nev.	10,000,000	100,000	100	80,000	Mar	1887	.50	
98	New Germany, G	N. S.	100,000	100,000	1	*				
99	New Pittsburg, S. L	Colo.	2,000,000	200,000	10	*				
100	North Standard, G.	Cal..	10,000,000	100,000	100	20,000	Nov			
101	Noonday	Cal..	600,000	60,000	10	208,000	Dec.	1881	.10	
102	Oneida Chief, G.	Cal.	500,000	125,000	4	*				
103	Oriental	Nev..	2,000,000	200,000	10					
104	Oriental & Miller, S.	Nev..	10,000,000	400,000	25			Aug	1887	.25
105	Osceola, G.	Nev..	5,000,000	50,000	100	*				
106	Overman, G. S.	Nev.	11,520,000	115,200	100	3,765,686				
107	Park, S.	Utah	2,000,000	200,000	10					
108	Peer, S.	Ariz.	10,000,000	100,000	100	135,000	Nov.	1886	.10	
109	Peerless, S.	Ariz.	10,000,000	100,000	100	320,000	Sept	1887	.25	
110	Phœnix	Ariz.	500,000	500,000	1					
111	Phœnix, G. S.	Ark.	5,000,000	200,000	25	*				
112	Ph

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

Name and Location of Company.	Oct. 22.		Oct. 24.		Oct. 25.		Oct. 26.		Oct. 27.		Oct 28.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L	
Alice, Mon	...	.....	.....	...	....	....	....	....	....	.....	...	....	.....
Argenta, Nev	....	.....	.....	.....	....	....	....	....	....	.....	...	....	.....
Bassick, Colo	....	....	....	...	....	....	....	....	....	.....	...	....	.....
Belcher, Nev	....	....	.....	....	....	....	9 38	....	8.63	....	....	....	200
Belle Isle, Nev	....	....	.....	....	1.00	....	....	....	90	.80	....	....	1,200
Bodie Cons., Cal	....	.	....	.....	2.30	....	.....	....	2 00	....	2.00	....	450
Breece, Colo	....	....	.....	.....	..	....	....	....	.....	.37	....	....	300
Bulwer, Cal	.....	....	....	.....	....	....	....	....	.95	.....	....	....	400
Caledonia, Dak	....	....	....	.....	....	....	1.55	....	....	....	....	....	50
Chollar, Nev	....	....	....	.....	....	.	..	....	5.50	....	....	....	300
Chrysolite, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Colorado Cent'l, Colo	....	....	....	....	2.30	2.20	....	....	2.25	....	2 25	....	900
Cons. Cal. & Va., Nev	16.75	.....	16.25	.....	17.00	16.88	16.13	.....	17.50	16.50	18.25	.....	2,115
Crown Point, Nev	....	....	....	....	....	....	....	....	8.00	....	....	....	150
Deadwood, Dak	2.75	.....	.....	.....	....	....	2.90	2.80	2.90	2.85	2.90	2 85	1,100
Dunkin, Colo	....	....	.....	.....	....	....	1.00	....	....	....	....	....	100
Eureka Cons., Nev	.....	.....	.....	.....	....	....	....	.....	6.63	.....	....	....	100
Father de Smet, Dak	....	.....	.....	.....	....	....	....	.....	....	....	....	....	.....
Freeland, Colo	....	....	.....	.....	....	....	....	.....	....	....	....	....	.....
Gold Stripe, Cal	....	....	.....	.....	....	....	....	.....	....	....	....	....	.....
Gould & Curry, Nev	.....	.....	.....	.....	....	....	....	.....	4 60	.....	5.25	.....	550
Green Mountain, Cal	.....	.....	....	.....	.05	....	....	.....	....	....	.05	...	1,200
Hale & Norcross, Nev	.....	.....	.....	.....	....	....	....	.....	4.10	... ..	4.20	....	600
Helena, Mont	....	....	....	....	....	....	....	....	....	....	....	....	.....
Holyoke, Idaho	.09	.08	.....	.....	.09	....	....	....	.09	....	....	....	1,800
Homestake, Dak	....	....	....	....	....	....	....	....	13.50	....	..	....	17
Horn-Silver, Ut	.90	.....	.90	.....	....	....	....	....	.90	.....	.....	....	500
Independence, Nev	...	...	...	...	....	....	....	....	....	....	....	....	.....
Iron Hill, Dak	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Iron Silver, Colo	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Leadville C., Colo	....	....	....	....	....	....	....	....	.40	....	..	....	500
Little Chief, Colo	.....	....	....	....	....	....	....	....	.29	.25	....	....	600
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	.35	....	100
Martin White, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mono, Cal	1.95	.....	....	....	....	....	1 95	.....	2.00	.....	....	....	900
Moulton, Mont	....	....	....	....	....	....	....	....	....	....	....	....	.....
Navajo, Nev	.....	....	.....	....	....	....	....	....	1.55	.92	....	....	1,300
North Belle Isle, Nev	....	....	....	....	....	....	11.13	.....	b 63	....	....	.....	250
Ontario, Ut	....	....	27.00	26.50	....	....	27.00	.....	....	....	....	.....	85
Ophir, Nev	8.00	.....	....	..	7.00	....	7.25	....	7.75	7.63	....	....	770
Plymouth, Cal	18.88	....	.....	....	....	....	....	....	18.75	18.63	....	...	250
Quicksilver Pref., Cal	.....	.....	....	....	....	....	....	....	....	....	....	....	.....
" Com., Cal	.. ..	.....	....	....	....	....	....	....	....	....	....	....	.....
Robinson Cons., Colo	.....	.....	.....	.....	....	....	....	....	....	....	....	....	.....
Savage, Nev	....	....	...	.....	8 13	...	.....	....	7.38	7.00	....	....	350
Sierra Nevada, Nev	..	....	....	....	....	....	....	....	4 40	4.00	4.85	4.75	900
Silver King, Ariz	6.13	.....	6.25	....	6.50	6.25	6 13	5.75	5.75	....	5.75	....	520
Standard, Cal	1.60	.....	.....	....	1.40	....	.....	....	.....	....	....	....	225
Stormont, Ut	....	....	....	....	....	....	....	....	....	....	....	....	.....
Surinam, D. G	3.65	.....	.....	....	3.65	.....	....	....	3.65	.....	3.70	....	400
Yellow Jacket, Nev	.....	.....	.....	....	....	....	....	....	....	....	....	....	.....

NON-DIVIDEND-PAYING MINES.

Name and Location of Company.	Oct. 22.		Oct. 24.		Oct. 25.		Oct. 26.		Oct. 27.		Oct. 28.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alta, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Amador, Cal	1.35	1 30	1 50	1.35	1.60	.....	1.50	1.40	1.40	1.35	1.35	....	5,700
Am. Flag, Colo	....	....	....	....	....	....	....	....	....	....	.06	.....	500
Barcelona, Nev	.50	.....	....	....	.....	....	.49	.....	.....	.....	.....	.....	400
Bechtel Con., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & B'licher, Nev	.....	.....	.....	.....	7.13	.....	7.13	.....	7.38	6.25	....	.....	500
Big Pittsb'g, Colo	.....	....	.....	.....	.....	....	.....	....	.....	.....	....	.....	.....
Brunswick	1.60	.....	1.60	.....	1.60	1.55	1 60	1.55	1.60	.....	1.60	....	3,400
Bullion, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cashier	....	....	....	....	....	....	....	....	.48	.45	.....	.....	400
Castle Creek, Id	.09	.08	.09	.....	.09	....	....	....	....	....	....	....	5,000
Central Ariz., Ariz	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Columbia & Beaver	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Con. Imperial	.....	.....	.....	.....	.....	.....	1.60	....	.....	.....	.....	.....	100
Con. Pacific	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Eastern Oregon	.02	.....	....	....	....	....	....	....	....	....	....	....	2,000
El Cristo, U. S. Col	2.10	2.00	2.00	1.95	2.00	1.95	2.00	1 90	2.10	2.00	2.05	2.60	1,750
Found Treasure	..	..	....	....	....	....	....	....	2.15	2.05	....	....	800
Hector	.80	.75	...	....	....	....	....	....	....	....	.75	.....	100
Julia, Nev	.65	.....	....	....	....	....	.55	.....	....	....	....	....	500
Kossuth	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lacrosse, Colo	....	....	....	....	.11	.....	....	....	....	....	.10	.. ..	1,300
Mexican, Nev	....	....	....	....	....	....	....	....	4.65	4.25	....	....	700
Middle Bar, Cal	.43	.41	45	.43	.45	...	.45	.44	.44	.....	.43	.....	8,100
Monitor	.18	.....	.18	.....	.18	.16	.18	.17	.18	.....	.18	....	7,300
New Pittsb'g, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
North Stand'd, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
N. Horn-Silv'r, Ut	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Oneida Chief	....	....	....	....	....	....	....	....	....	....	....	....	.....
Pri'nt'l&Mil'r, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.12	....	1.000
Phoenix of Arkan's	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Phoenix of Arizona	...	.....	1.00	75	.60	....	.70	.60	.....	....	....	....	1,100
Potosi	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rappahannock, Va	.18	.....	....	....	.18	.17	.18	.16	.18	.17	.18	.17	14,000
Red Elephant, Colo	....	.. ..	.02	....	....	....	....	....	....	....	....	....	200
Renfrew, N. S	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Saint Kevin, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
San Sebastian	....	....	...	....	....	....	....	....	....	....	....	....	.....
Santiago, U. S. Col	....	....	....	....	....	....	....	....	....	....	....	....	.....
Security, Colo	2.13	1.50	2.13	1.38	1.75	1.50	1.88	1.60	1.88	1 63	1.75	1.37	10,450
Silver Cliff, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Leaf	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Queen, Ariz	....	....	.02	....	.02	.....	.02	.....	....	....	....	....	2,000
Stanislaus, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
State L'e, 1&4, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
" Nos. 2 & 3, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sutro Tunnel, Nev	.39	.37	.38	.36	.37	.36	.38	.35	.38	.36	.39	.38	39,420
Taylor Plumas, Cal	...	....	....	....	....	....	....	....	.04	....	....	....	2,500
Tioga	....	....	....	....	....	....	....	....	....	....	....	....	.....
Tornado	1.15	.....	1.15	....	1.15	....	1.25	1.20	1.25	1.15	1.25	....	7,800
Union Cons. Nev	....	.....	.....	.....	.....	.....	.....	.....	3.50	3 40	4.05	4.00	550

*Dealt in at the New York Stock Exchange. Unlisted Securities

BOSTON MINING STOCK QUOTATIONS.

Name of Company.	Oct. 21.		Oct. 22.		Oct 24.		Oct. 25.		Oct. 26.		Oct 27.		Sales.
Atlantic, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bodie, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bonanza D	.80½	.77½	.75	.....	87½	.....	.90	....	.87½	85	.85	.....	1,350
Boston & Mont., Mont	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Breece, Colo	.44	.43	.45	..	.47	....	.45	.....	.42	.....	.45	.....	2,600
Calumet & Hecla, Mich	194	....	.....	.....	194	193	.....	.....	195	.....	195	.....	55
Catalpa, Colo	26	.....	.25	.....	.. ..	....	.. ..	....	.25	.....	.25	.....	1,300
Central, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Virginia, Nev	....	.....	....	.....	....	....	....	....	....	....	....	....	.....
Dunkin, Colo	1.10	1.07	.. ..	.. ..	1.10	.....	1.10	1 05	1.07	1.05	1½	1.07	2,112
Enterprise	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eureka, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin, Mich	....	.....	.....	.....	10.00	....	.....	.....	10.00	.....	9.75	....	220
Freeland, Colo	.....	.....	.....	.....	.. ..	.....	.60	.....	.....	.....	.....	.. ..	10
Honorine, Utah	.....	.. ..	.....	.. ..	.....	.....	.....	.....	.....	.....	.....	.. ..	.....
Ironton Iron Co., Mich	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Chief	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Napa, Cal	.....	.....	1.13	.....	.....	.....	.....	.....	.....	.....	1.13	.....	200
Osceola, Mich	20.00	18.00	20.00	19.00	19.25	19.00	18.50	.....	19.00	18.00	18.00	15 25	2,471
Pewabic, Mich	....	....	.....	.....	2.00	.....	.....	.....	2.00	.. ..	... ..	.....	305
Quincy, Mich	.....	.. ..	.....	.....	48.00	47.50	.....	.....	.....	.....	47.00	.....	100
Robinson, Colo	.....	.....	.. ..	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver King, Ariz	... ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Standard, Cal	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stormont, Utah	.08	.....	.....	..	.08	.....	.08	.....	.07	.06	.07	.....	2,500
Surinam, D. G	... ..	..	..	..	..	..	..	..	..	..	..	..	..

Name of Company.	Oct. 21.		Oct. 22.		Oct 24.		Oct. 25.		Oct. 26.		Oct. 27.		Sales
Allouez, Mich	.50	.. ..	.....	.....	.50	.....	.52½	.....	.55	.....	....	....	1,000
Arnold, Mich	.....	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.. ..	.. ..	.....
Aztec	.....	.. ..	.....	.. ..	.....	.....	.....	.....	.....	.....	.. ..	.. ..	.....
Blue Ridge, Mich	.....	.. ..	.....	.. ..	.....	.....	.....	.....	.....	.....	.. ..	.. ..	.....
Bijou	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000
Bowman Silv'r, Nev	.....	.....	.05	.....	.05	.....	.05	.....	.....	.....	.....	.....	1,375
Brunswi'k	1 60	.....	1 60	.....	1.60	1.55	1.60	1 55	1.60	.....	1.60	.....	1,400
Cashier, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Contentment	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crescent, Colo	10	.....	.....	.....	.....	.....	.10	.....	.....	.....	.....	.....	900
Cusi, N. Mex	23	.22	.23	.....	.22	.21	...	....	.....	.....	.....	.....	1,600
Decatur, Colo	... ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
El Cristo	... ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Huron, Mich	.....	.....	... ..	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kossuth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.10	.....	200
Mono, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
National, Mich	.. ..	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oriental & M., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.15	.....	100
Phœnix, Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, Va	.....	.....	.17	.....	.17	.....	.17	.....	.18	.....	.17	.....	2,200
Security, Colo	.....	.. .	1.75	.....	1.75	.....	1.50	.....	.....	.....	1.50	.....	500
South Side	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel, Nev	.37	.....	.37	.....	37	.....	.38	.....	.37	.. ..	.37	.. ..	3,500
Tamarack	.....	.....	100	99.00	.....	.....	.. ..	.....	.....	.....	.....	.....	6
Taylor Plumas, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

New York: Dividend shares sold, 19,182. Non-dividend shares sold, 118,470. Total New York, 137,652.
Boston: Dividend shares sold, 12,823. Non-dividend shares sold, 13,781. Total Boston, 26,604.

COAL STOCKS.

Name of Company.	Par value of shares.	Oct. 22.		Oct. 24.		Oct. 25.		Oct. 26.		Oct. 27.		Oct. 28.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal	...	.....	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & O. RR	100	.....	.....	.....	.....	.....	.....	.....	.....	5¼	5⅛	5¾	5	550
*Chic. & Ind. Coal RR	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	100	27½	26¾	26⅞	....	26⅞	26¾	27⅝	26⅝	28	27	27⅝	27	8,960
Col., C. & I	100	33	32	33	32	33	31⅝	34	33	33	.. ..	32¾	32½	3,040
Consol. Coal	100	.....	.....	23	.....	22	.....	.....	.....	22½	.....	22½	.....	400
Cumb. C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C	100	.....	.....	99	98	.....	.....	.....	.....	100	99¼	100¾	99¾	3,963
D., L. & W. RR	50	126	125½	125⅝	124½	126	124½	126½	125⅝	126⅞	126	126⅞	125⅝	55,001
Elk Lick Coal Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hocking Valley	100	24	.....	23¾	23⅛	23½	23⅛	23¾	23½	24	23⅞	.....	.....	1,650
Lehigh C. & N.†	50	.....	.....	.....	.....	47¼	.....	.....	.....	47¼	47	.....	.....	165
Lehigh Valley RR.†	50	54¾	54½	54⅛	.....	55	54¾	55	.....	55¼	54⅞	...	.....	264
L. & W. C. & I. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marshall Con. Coal	100	...	.....	.....	.....	.....	.....	.....	.....	8	7	.....	.....	200
Maryland Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montauk Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	50	.....	.....	135½	.....	.....	.....	.....	.....	.....	.....	136	.....	92
New Central Coal	100	.....	.....	13	.....	12⅝	.....	.....	.....	.....	.....	.....	.....	200
N. J. C. RR	100	73	72½	72⅝	72	72¾	71¾	73⅝	73	73¾	73	73¾	72½	11,840
N. Y. & S. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	.....	.....	.....	.....	9¼	9	8⅞	8¾	.....	.....	8¾	.....	865
Do. pref	100	28	.....	28	.....	27¼	27	28	27½	.. ..	.....	27½	.....	1,350
N. Y. & Perry C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk & Western R R	100	.....	.....	.....	.....	.....	.....	.....	.....	15½	.....	.....	.....	10
Do. pref	100	38	37¾	37¾	37	38	36¾	38⅝	38	40	39	39⅞	38¾	8,770
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.†	50	55⅞	55⅝	55½	.....	55⅝	55½	55½	55⅛	55¾	55½	.....	.....	6,114
Ph. & R. RR.**	50	61⅝	61	61⅝	60½	61¾	60⅝	62½	61⅝	62⅛	62⅛	63½	62¼	370,648
Spring Mountain	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co	100	25½	.. ..	.....	.....	24½	24⅜	.....	.....	25	24½	25	24⅝	1,400
Westmoreland Coal†	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

** Of the sales of this stock, 57,428 were in Philadelphia, and 313,220 in New York
† The quotations for these stocks are not percentage, but actual price.
Dealt in at the New York Stock Exchange, Unlisted Securities.

Total sales, 475,485.

San Francisco Mining Stock Quotations.

Company.	Closing Quotations. Oct. 21.	Oct. 22.	Oct. 24.	Oct. 25.	Oct. 26.	Oct. 27.	Oct. 28.*
Alpha	....	....	....	....	....	....	.....
Alta	2⅞	2 9-10	3	3	3	3⅛	.....
Argenta	....	....	....	....	....	....	.....
Belcher	....	....	....	....	....	....	.....
Belle Isle	1	.....	9-10	4-5	¾	4-5	.....
Best & Bel	7⅛	7⅛	6⅞	6¼	6⅝	7	7
Bodie	2⅛	2 1-5	2¼	2	2	.....	.....
Bulwer	1	.....	1⅛	.....	1	1	.....
Chollar	6⅛	6⅛	5⅞	5⅛	5⅝	5¾	5⅞
Com'nwith	.....	.....	2⅛	2⅛	2⅜	.....	.....
Con. C. & V.	16⅝	16⅛	16⅝	16¼	16¾	17¼	17¾
Con. Pac.	.....	.....	.....	.....	.....	.....	.....
Crown Pt.	11¼	11⅛	12⅛	9⅛	8⅞	9⅛	.....
Eureka C.	7⅛	.....	.....	.....	.....	.....	.....
Gould & C.	5	4⅞	5	4¾	4⅝	4⅞	4 3-5
Hale & N.	4⅜	4 3-10	4¼	4⅛	4¼	4¼	4 3-10
M. White	.....	.....	.....	.....	.....	.....	.....
Mexican	4½	4 3-5	4⅝	4¼	4.27½	4⅞	4¾
Mono	2	2	2	2	... ..	1¾	.....
Mt. Diablo	4¼	.....	4¼	.....	.....	.....	.....
Navajo	1½	.....	.....	1⅛	.....	.....	.....
Nev. Queen	5¼	5⅛	5	5	4⅜	4¼	.....
N. Belle I.	11	11⅛	11⅛	11	10½	10	.....
Ophir	8⅛	8¼	8	7¾	7¾	8⅞	8⅝
Potosi	6½	6⅝	6¼	5¾	6⅛	6	.....
Savage	8¼	8	8	7¼	7½	7⅜	7⅝
Scorpion	.....	.....	.....	.....	.....	.....	.....
Sierra Nev.	4½	4 2-5	4⅜	4¼	4¼	4⅞	.....
Sutro Tun.	.....	.....	.....	.....	.....	.....	.....
Tip Top	.....	.....	.....	.....	.....	.....	.....
Union Con.	3⅛	3 3-5	3½	3⅜	3½	3⅞	.....
Utah	1⅞	1 9-10	1⅞	1¾	1⅞	2¼	.....
Yellow Jkt.	5¾	6⅛	6¾	5¾	5¾	5⅞	6

* Opening quotations.

40 per cent; to tobacco, about one half, and to rice. In the Indian corn belt, where so much premature complaint was made, a few months ago of a short crop, the distribution of dry goods, boots and shoes and groceries is quite active, pointing to the lack of information possessed by the disseminators of reports of the nature of that referred to. Receipts of wheat at primary markets at the West during the week will amount to about 4,000,000 bushels, and exports of wheat (and of wheat flour) this week, as exclusively reported to *Bradstreet's* will aggregate, both coasts, about 2,065,000 bushels, as compared with about 1,790,000 bushels last week, in the face of a commonly expected (and reported tendency to) decline. The industries are quite active. Local mining in Eastern Pennsylvania is pushed to the full capacity of the miners engaged in the Schuylkill and Wyoming regions, but the demand is not fully met, as the West reports premiums offered for prompt shipments and the request in excess of the supply held there. The advance of shipping rates to the West of 10 per cent, to be made at an early date, promises to complicate the situation. A meeting of coal company managers was to be held at Philadelphia to-day to take action in reference to advancing the price of anthracite coal. Bituminous coal is 25 cents per ton higher at Northern Atlantic ports, and there are reports of many consumers of anthracite having resorted to bituminous to meet their wants. Higher prices for anthracite must react upon producers of anthracite pig-iron, who are not meeting thus far with any improvement in the demand for iron. Prices, however, are firmly held. The tendency of prices of pig-iron at St. Louis is downward, owing to the many large consumers in that vicinity holding off in expectation of a decline in quotations. There is also a noticeable slackening in the demand at Cincinnati and Chicago. Shipments of Southern iron West have been checked as reported, owing to a scarcity of cars. Sales of Southern iron at St. Louis and Cincinnati are less owing to a rather better demand from the East. There is no improvement in steel rails, and while the mills still have heavy deliveries to make on 1887 account, orders for next season's deliveries are very light, and there are rumors of $33 per ton at the mill at the East having been accepted for next season's delivery. There is a practical coal famine at Louisville, and Cincinnati is likewise affected, owing to low water in the Ohio River having delayed shipments of soft coal from Pittsburg. Prices per ton per boat load at Louisville, which usually range from $3@$3.50 at this time, have been quoted at $4.50 within a few days, and $5 has been or will be reached if no relief is forthcoming.

The local money market is easier and rates are about as last quoted. All the scare over tight money appears to have disappeared for the time being, although a few cities, notably Cleveland and Pittsburg report money markets working close, but with regular customers of the banks accommodated. The return flow of currency from the West appears to be delayed somewhat longer than was expected, but the condition of the banks at New York and Boston has materially improved within a fortnight, and no fears of any special stringency are entertained.

The Coal Road Stocks.

The Wall street stock market is confidently asserted by a number of leading operators to be on the eve of a continued recovery from the late era of depression. Mr. Gould's intended departure for Europe has been seized upon by the bears as leaving the market open to their attacks, but it is too early to form a definite notion from data so indefinite.

The record of the week favors a belief in a reasonable degree of firmness. The weakest point in connection with the stock market, however, lies in the continued absence of buying on the part of the outside public. Reading shares have improved moderately during the week, gaining from last Friday to tonight 1⅛c. Delaware, Lackawanna & Western declines ⅝c.: Jersey Central, ⅝c., and Delaware & Hudson gains ⅞c.

The Tennessee Coal and Iron Company, it is reported, has canceled $540,000 of its first mortgage Birmingham Division bonds. This leaves $3,460,000, as the first mortgage as listed on the Stock Exchange was $4,000 000

Mining Stocks.

This has been one of the most active weeks for mining stocks we have had for a long time past, notwithstanding the fact that the attention of the brokers has been to a great extent absorbed by the wide fluctuations and heavy dealings in oil, which always interferes more or less with operations in mining shares. The first heavy day's business for months occurred on Thursday, when 52,000 shares changed hands, the most gratifying fact connected therewith being that over forty different shares were dealt in, some of which sold at much higher figures, and many closing at the highest prices of the day. As might be expected this produced a very cheerful feeling, and it is thought that the remaining two months of the year will yet witness a booming market.

El Cristo has at times given signs of life, and there has been an occasional inquiry for the stock, but the general verdict now is that nothing is to be expected so long as the present Harpending régime continues in power. Believers in the intrinsic value of the property are numerous, but there must be a change before speculation in the stock shows an improvement. The sales this week amounted to 1750 shares, at prices ranging from $1,90 to $2.10.

Phœnix of Arkansas is conspicious by its absence in the official list of transactions.

The collapse of the Gogebic boom, which has for some time past been reported in these pages, has not been a surprise to any reader of THE ENGINEERING AND MINING JOURNAL. During the entire year we have called attention to the wild speculation which was going on on the Range, and have warned our readers of its inevitabe collapse. This has, of course, put an end to the selling of wild cat prospects and of option stocks, and though it has greatly reduced the fancy figures at which the stocks of some of the best mines were selling, it has not affected and will not affect their intrinsic value or earning power. The Gogebic has a number of magnificent mines which will continue to be worked at a satisfactory profit, and their stock will always deservedly command a large price. The present tumble is due in part to the expensive system of mining in use; in part to the abnormal lake freights that absorbed all the profits the miners might reasonably have expected, and in large part to the total lack of working capital that greatly added to the cost of producing ore, and lessened the prices which might have been obtained for it.

Some idea of the decline which has taken place in the stocks may be gained from a circular just issued by Mr. John E. Burton, asking the stockholders of the following mines to accept about $1,500,000 for their properties which they had recently bonded at $2,320,000. From Mr. Burton's circular we quote:

"*I will devote myself in the future with all my strength to the successful consummation of the best deal possible, which shall dispose of our five properties and bring the money quickest to the stockholders.* With this determination in view I make the following statement and advise our stockholders to comply with it *by first mail.*" In brief it is this:

"The parties furnishing the means to carry the Bessemer Consolidated deal through have taken pains to send five disinterested experts, at different times, to visit all our mines, making notes in detail and report as to the value of the properties. The reported value has varied from $850,000 to $1,500,000, while the Consolidated Company under the contract were required to pay $2,320,000. I am authorized by the projectors to say, that *if the stockholders will immediately place their stocks or trustee's certificates (which are one and the same), immediately in the hands of the American Loan and Trust Company, of this city, subject to my order as trustee, they will undertake to pay for the same, in cash, within ninety days, on the following basis:* $600,000 for Iron King, or $15 per share; $200,000 for Bonnie, or $5 per share; $160 for First National, or $2 per share; $120,000 for Blue Jacket, or $3 per share; $240,000 for Valley, or $2 per share; total, $1,320,000.

"If all stockholders will accept the situation and forward their stocks immediately under the proposition, the deal will unquestionably be closed, and all will have their money by New Year's, or at farthest January 25th, and the Bessemer Consolidated officials will assume the responsibility of raising the quarter of a million dollars necessary to pay the remaining debts and continue the working of the mines, *leaving the above prices net to our stockholders.*"

The Moore-Benjamin miners have not as yet made any new deal, but it is thought that the Aurora mine will be sold in Boston, as announced elsewhere.

In Brunswick the trading during the week has been light, but prices have been well maintained. It is stated that very satisfactory progress is being made at this mine. Sales were made at from $1.55 to $1.60. Plymouth Consolidated was lower, declining from $18.88 to $18.60. Little was doing in Bodie, the shares of which were quoted at from $2.30 to $2. Bulwer shows one sale at 95c. Mona, a few at from $1.95 to $2. Green Mountain at 5c. Some 1100 shares of Hector sold at from 75c. to 80c. Taylor Plumas shows a sale at 4c.

It is claimed that 1000 shares of the 52,000 traded in on Thursday were in Middle Bar and 850 in Amador. It is scarce worth the while to again advert to the fact that nearly all, if not all, of those alleged sales are of the wash order. The price of the former was held by the manipulators at from 41 to 45c., and of the latter at from $1.30 to $1.50.

A suit was brought by David Friedlander, a stockholder in the Horn-Silver Mining Company, in the Supreme Court, New York City, against C. G. Francklyn, as President of the company, and against W. F. Van Pelt, Treasurer; W. S. Hoyt, Secretary, and F. G. Brown, ex-Vice-President to compel an accounting of the $650,000 taken from the treasury of the company, and said to have been lent most of it to Francklyn on undiscovered security. Judge Donohue made an order on the 27th inst. requiring the defendants to show cause why they should not forthwith return the money to the treasury or be held individually liable for the claim. The stock attracts but little attention and is selling at 90 cents per share. Ontario has advanced to $27.

The Tortilita management have announced to the Consolidated Stock and Petroleum Exchange that they will appear before the Committee on Mining Securities on Monday next, when they will be prepared to answer all questions regarding the property and its management and incidentally show the reason for the *Herald's* attacks.

Tornado has made some headway in price, and the stock is being firmly held at from $1.15 to $1.25. Found Treasure was only dealt in on Thursday, when it sold at from $2,05 to $2.15. North Belle Isle declined from $11.13 to $9.63. Navajo from $1.35 to 92c., and Belle Isle from $1 to 89c.

Consolidated California & Virginia attracted considerable attention, and showed an upward tendency, the price advancing from $16.25 to $18 25. Sierra Nevada was active and higher, going from $4 to $4.85. Savage declined from $8.13 to $7, Ophir from $8 to $7, but towards the close the price again advanced to $7.75. Hale & Norcross was quiet at from $4.10@$4.20. Gould & Curry advanced from $4.60@$5.25; Union Consolidated, from $3.40@$4.05. Crown Point shows one sale at $8; Chollar one at $5.50. Julia declined from 65@55c., and Best & Belcher from $7.38@$6.25. Sutro Tunnel, as usual, contributed the largest share of business to the week's transactions, which amounted to 39,420, at prices ranging from 35@39c.

Considerable interest has been displayed in Silver King. The stock has been dormant for many weeks. The price declined from $6.50 to $5.75.

Phœnix of Arizona showed a downard tendency, going from $1 to 60c.

Some 14,000 shares of Rappahannock changed hands at prices ranging from 16 to 18c.

Surinam sold at from $3.65 to $3.70.

Security is again on the downward grade, the price declining from $2 13 to $1.37. Monitor was quiet, at from 16 to 18c. Lacrosse at 10@11c. Cashier was entirely neglected, and shows sales of only 400 shares at from 48@45c. Breece one at 37c. Some interest was taken in Colorado Central, the price of which was firm at from $2.20@$2.30. Dunkin at $1. Leadville at 40c. Little Chief at from 25@29c.

Meetings.

The annual and special meetings of the following companies will be held at the times mentioned:

Sawer-Man Electric Company, No. 32 Nassau street New York City, November 5th, at eleven o'clock A.M.

Adams Mining Company, Nos. 346–348 Broadway, Room 41, New York City, November 17th, at twelve o'clock M. Annual election and for the purpose of voting on the proposition to establish a branch office of the company at St. Louis.

San Pedro Company, office of Geo. Wm. Ballou & Co., No. 5 Wall street, November 8th, at eleven o'clock A.M.

Dividends.

Granite Mountain Mining Company, of Montana, has declared a dividend, No. 35, of fifty cents per share, or $200,000, payable November 10th, at Room 35, No. 204 North Third street, St. Louis, Mo.

Mammoth Mining Company, of Utah, has declared a dividend, No. 2, of $10,000, payable November 10th, at Room 5, Hooper and Eldridge Block, Main street, Salt Lake City, Utah.

Marshall Consolidated Coal Mining Company, of Colorado, will pay coupons due November 1st, at Farmers' Loan and Trust Company, New York City.

Rio Tinto Company, Lt., of Spain, has declared an interim dividend of three shillings per share, payable November 18th, on presentation of coupon No. 18, either at the company's office in London, or at the Société Générale, rue de Provence, 54, Paris, or at the Deutsche National Bank in Bremen.

Small Hopes Consolidated Mining Company, of Colorado, has declared a dividend (No. 58), of twenty cents per share, or $50,000, payable October 30th.

Standard Consolidated Mining Company, of California, has declared a dividend, No. 67, of five cents per share, or $5000, payable November 12th, at Farmers' Loan and Trust Company, No. 22 William street, New York City.

Whitebreast Fuel Company has declared a quarterly dividend of one and three quarters per cent, payable November 1st, at No. 18 Broadway, New York City.

Assessments.

Company.	No.	When levied.	D'l'nq't in office.	Day of sale.	Am'nt per share.
Anchor, Utah	2	Sept.20	Oct. 22	Nov. 12	.20
Atlas, Dak	....	July 22	Sept.30	Nov. 15	.001
Belcher, Nev	33	Sept.15	Oct. 20	Nov. 7	.50
Como-Eureka, Nev	2	Sept.10	Oct. 18	Nov. 26	.06
Concord, N. C	....	Sept.16	Oct. 31	.....	.02
Cons. Pacific, Cal	9	Sept. 6	Oct. 11	Nov. 8	.15
Golden Fleece, Cal	11	Oct. 15	Dec. 7	Jan. 4	.10
Golden Prize, Nev	8	Oct. 4	Nov. 4	Dec. 5	.40
Himalaya, Utah	2	Oct. 10	Nov. 10	Dec. 12	.005
Kearsarge, Mich	...	Oct. —	Oct. 15	... ...	1.00
Mayflower, Cal	38	Sept.27	Nov. 1	Nov. 22	.25
Mikado, Mich†	....	Sept.13	Oct. 22	.....	.40
Missoula, Utah	2	Oct. 11	Nov.15	Dec. 5	.02
Mono, Cal	24	Sept.15	Oct. 20	Nov. 21	.50
Mutual, Dak	3	Oct. 3	Nov.12	Dec. 12	.01
New Basil Cons., Cal.	12	Sept.13	Oct. 18	Nov. 1	.02½
North Bonanza, Nev.	7	Sept.27	Oct. 31	Nov. 18	.15
Peerless, Ariz	10	Sept.20	Oct. 27	Nov. 18	.25
†Pilgrim, Mich	...	Sept.12	Oct. 22	....	.15
Pioche Cons., Nev	3	Sept.14	*Nov. 7	*Nov26	.10
Prior, Dak	1	Oct. 11	Nov. 11	Nov. 28	.002
Rochester, Utah	...	Sept.19	Oct. 20	Nov. 5	.05
Savage, Mo	69	Sept. 8	Oct. 11	Oct. 31	.50
Scorpion, Nev	22	Oct. 7	Nov.11	Dec 5	.10
Segreg. Iron H., Dak	2	Oct. 17	Nov. 20	Dec. 7	.01
Spruce Gulch, Dak	2	Sept.14	Oct. 20	Nov. 10	.01
Sugar Loaf Hill, Dak	2	Oct. 17	Nov. 17	Dec. 3	.001
Taylor Plumas, Cal	‡2	Oct. 17	Nov. 20	Nov.20	.02
Utah, Nev	2	Aug.10	Sept.12	Oct. 29	.25
Virginia Creek, Cal	4	Sept.27	Nov. 1	Nov. 30	.05
Weldon, Ariz	1	Sept.20	Oct. 25	Nov. 15	.20

* The delinquent day and the day of sale were postponed to dates given above.

† Levied on assessable stock only.

‡ The assessment of five cents per share, levied August 8th, has been rescinded.